



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: <b>PCT/NZ00/00043</b></p> <p>(22) International Filing Date: <b>31 March 2000 (31.03.00)</b></p> <p>(30) Priority Data:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">334986</td> <td style="width: 40%;">31 March 1999 (31.03.99)</td> <td style="width: 30%;">NZ</td> </tr> <tr> <td>335023</td> <td>7 April 1999 (07.04.99)</td> <td>NZ</td> </tr> <tr> <td>335190</td> <td>14 April 1999 (14.04.99)</td> <td>NZ</td> </tr> <tr> <td>335191</td> <td>14 April 1999 (14.04.99)</td> <td>NZ</td> </tr> <tr> <td>335192</td> <td>14 April 1999 (14.04.99)</td> <td>NZ</td> </tr> <tr> <td>335933</td> <td>26 May 1999 (26.05.99)</td> <td>NZ</td> </tr> <tr> <td>335935</td> <td>26 May 1999 (26.05.99)</td> <td>NZ</td> </tr> <tr> <td>336964</td> <td>27 July 1999 (27.07.99)</td> <td>NZ</td> </tr> <tr> <td>501355</td> <td>29 November 1999 (29.11.99)</td> <td>NZ</td> </tr> <tr> <td>501870</td> <td>20 December 1999 (20.12.99)</td> <td>NZ</td> </tr> <tr> <td>502291</td> <td>12 January 2000 (12.01.00)</td> <td>NZ</td> </tr> <tr> <td>503449</td> <td>20 March 2000 (20.03.00)</td> <td>NZ</td> </tr> </table> <p>(71) Applicant (for all designated States except US): <b>TELESHOPPING LIMITED [NZ/NZ]; 38 Whitaker Place, Auckland 1001 (NZ).</b></p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): <b>WITEHIRA, Pita [NZ/NZ]; Devine Road, RD 3, Hamilton (NZ). BYDDER,</b></p>		334986	31 March 1999 (31.03.99)	NZ	335023	7 April 1999 (07.04.99)	NZ	335190	14 April 1999 (14.04.99)	NZ	335191	14 April 1999 (14.04.99)	NZ	335192	14 April 1999 (14.04.99)	NZ	335933	26 May 1999 (26.05.99)	NZ	335935	26 May 1999 (26.05.99)	NZ	336964	27 July 1999 (27.07.99)	NZ	501355	29 November 1999 (29.11.99)	NZ	501870	20 December 1999 (20.12.99)	NZ	502291	12 January 2000 (12.01.00)	NZ	503449	20 March 2000 (20.03.00)	NZ	<p>Evan, Lloyd [NZ/NZ]; 7 Carlson Crescent, Hamilton 2001 (NZ).</p> <p>(74) Agents: <b>PIPER, James, William et al.; Pipers, Unicorn House, 300A Richmond Road, Grey Lynn, Auckland 1002 (NZ).</b></p> <p>(81) Designated States: <b>AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</b></p> <p><b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i></p>
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<p>(57) Abstract</p> <p>An automated transaction system is provided whereby, using a personal ordering device (POD) (101) a user may respond instantaneously (e.g. by "one click" of a button) to information relating to a product or service as a basis for transaction. In preferred forms of the invention a broadcast advertisement is accompanied by a machine readable code which is associated by the POD with details relating to the user (e.g. identity, address, payment information) and the POD either then or subsequently telephones the combined information to a central processing unit for despatch of the ordered goods or services to the user.</p>																																						

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## AUTOMATED TRANSACTION SYSTEM AND METHOD OF USING SAME

### TECHNICAL FIELD

This invention relates to an automated transaction system and method of using the same.

### BACKGROUND OF THE INVENTION

5 As the lifestyles of communities around the world have evolved over the centuries, the industry of selling and paying for goods and services has had to adapt. With the advent of the automobile and telecommunications, the twentieth century has seen a more dramatic change in this industry. In particular, the predominance of commerce has shifted from local markets and stores to large national  
10 retailers, direct marketing through toll free numbers, catalogs and the Internet. The retailing and services market has become fiercely competitive on not only a national scale, but also on a global scale. Merchants and service providers, therefore, have been forced to focus even more on differentiating themselves from their competition through cost, quality, convenience and customization in order to maintain or attract more customers.

To achieve this differentiation on a national and global scale, companies have had to adapt by more  
15 effectively relying upon non-traditional non-interactive forms of communications media incorporating convenient payment mechanisms (e.g. credit cards) into their operations and most recently reorienting their businesses around remote ordering paradigms such as centralized operation (e.g. call centers or electronic commerce on Internet world wide web sites) with decentralized distribution.

Consumers have for some time interacted with multiple forms of media including television, radio,  
20 newspapers, magazines, posters, catalogs, brochures, kiosks, the Internet, billboards and even labelling (hereinafter referred to as "source media") in respect of obtaining or providing information, goods and services. Typically, interaction has been by way of a follow-up telephone call in response to a media promotion or the completion of a written or electronic order form. An electronic response generated by way of completing an order request by the use of a computer interface, such as a key pad, voice  
25 activated interactive switching or even a touch screen, are common methods used by consumers to respond to Internet media promotions. Other electronic devices such as plug-in or wireless palm pilots,

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notebook computers and telephones provide interactive systems for consumers to order goods and services in response to promotions.

Interaction with a multiplicity of source media has been evolving from the early days of simple print media response. i.e. manually filling out an order form and posting it off to the advertiser or agent.

- 5 Printed catalogs are still in common use today. Responses to promotions can also range from dialling a free phone number for logging an order or request, to comprehensive electronic commerce approaches which involve the use of electronic devices such as computers and hand-held devices. Direct interactive ordering systems, particularly those connected to cable television networks, have also been in use whereby those systems provide consumers with apparatus to log orders for items promoted during a  
10 television promotion.

Internet operating systems are also available for consumers wishing to respond to promotions.

- One new approach to interactive media promotion has been a move to merge the Internet with television viewing. This approach is sometimes referred to as "convergence". Various companies are also promoting interactive household devices such as mobile phones, wireless palm pilots and household  
15 appliances all connected to the world wide web. Such devices may be used to respond to promotions or order goods and services promoted through the Internet.

Remote shopping is already a well established system of commerce. A typical remote shopping format is based on the distribution of information about goods, products or services together with details of how and who to contact to order the goods, to pay for them and to arrange or accept delivery.

- 20 The advantages of remote shopping are that the purchaser has access to a wider range of goods, services and products irrespective of where they are stationed. Remote shopping saves time, fuel, cost and inconvenience. It encourages competition and may enable consumers to meet their needs at a lower cost than is otherwise possible. It eliminates travel, parking problems, and exposure to hazards such as adverse climate, high traffic densities and security risks. Collection, transportation or delivery problems  
25 associated with purchased goods can be reduced or eliminated. Remote shopping has advanced to allow for so-called 'electronic commerce' through use of and connection to the rapidly expanding world wide web.

- Merchants use all forms of media to advertise and/or promote goods and services. Consumers use all forms of media including the Internet to gather news and information, compare promotions, bid for or  
30 purchase items and services. The media is also used for public or official notices some of which require

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responses from citizens. Live performances and even meetings can also be used to promote goods & services.

Generally advertising is used to inform or remind people of a particular product or brand of product. Other forms of advertising or promotion include so-called "Infomercials". This form of marketing is designed to capture a response from a listener or viewer during the Infomercial or as soon thereafter as possible.

Electronic commerce systems which require a response from the user are generally useable by only a small number of potential customers. The cost of such appliances may also be prohibitive to the mass market. The inclusion of various operating switches and systems in personal appliances, including Internet appliances, palm pilots and mobile telephones, can make it difficult for a consumer to easily navigate the required switching sequences to activate and/or process an order or access the Internet. It has also proved to be difficult to capture a high proportion of potential responders to an advertisement or promotion, particularly from Infomercial promotions. Most consumers, even if tempted to respond, either forget to follow up on their impulse to respond, forget the telephone number, or give up due to the associated complexities in attempting to place an order or response to the said promotion. Importantly the lack of readily available responsive systems results in a time lapse which usually results in the impulse to purchase an item being lost.

Merchants and promoters resort to expensive advertising campaigns to continuously remind consumers of their particular product, brand or service. In many cases consumers are still put off by the complexities of placing an order. In some cases, promoters provide large infrastructures to process incoming orders. These include manning of phone-banks and direct voice activated answering and processing systems. Consumers may still forget the telephone number or in many cases find the line busy and then give up. Many consumers are not comfortable with talking to interactive voice recorders or any machines in general. Regardless of the cost of an advertising campaign, which may include incentives and prizes, there is inevitably a loss of potential customer response due to the passing of time, complex ordering processes and/or failure by the consumer to recall details.

It is similarly difficult for consumers to recall Internet addresses in order to follow-up on promotions through this mode.

Many householders find navigating the Internet complex and unwieldy. Unlike television which is a "distant" viewing media, the Internet requires close-up interaction and some knowledge of processes involved. The use of a keyboard, the design of which dates from the 1800s, is at odds with normal

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"human motor rhythms". Thus shopping on the Internet is a challenge for those not familiar with these systems. Although use of the television remote controller to change volume and channels is relatively straight forward, the standard remote controller is not presently capable of more complex interaction with normal television use. Modification of the format to allow more complex interaction by consumers with television programs and promotions, including interactive TV and the use of "set top boxes", generally requires the remote controller and customer interaction processes to be modified and thereby become more complex.

The emergence of various Internet appliances, such as wireless palm pilots, have increased consumer access to electronic commerce. However, these devices are expensive and also relatively complex to operate. Expanding use of the Internet for electronic commerce has added significant costs to telephony interface and processing networks.

Merchants and promoters have also been using a form of interactive television which provides for a coding system that allows for consumers using a television remote control to instantly respond to advertisements. The use of matching codes for television commercials is also being merged with Internet type promotions to provide a more convenient method of remote shopping. These systems generally are linked to cable networks and/or specific Internet sites and are restricted to the advertisement only.

Security of transactions has presented significant problems for both merchants and consumers. A Personal Identification Number (PIN) is one method commonly used to enhance security for remote or live transactions including Internet transactions. Passwords are used jointly with PIN numbers or separately within all forms of commerce security checking. Consumers find it difficult to remember numerous PIN and passwords as electronic commerce expands. Other forms of security checks include electronic fingerprint and even iris comparisons. Such systems are expensive and require complex electronic, optical and verification programs. The transfer of personal details, including credit card number, via telecoms and the Internet is risky and prone to errors and misuse.

Various companies have introduced a type of web television in an effort to entice passive television watchers to interact with promotions. One such company, HouseCom International Telecommunications, of the United Kingdom, provides a "net station" to allow consumers to browse, interact and purchase goods and services from a television via an Internet interface. WebTV of Mountain View California, USA, offer a similar service.

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US Patent No 5995134 assigned to Time Warner Cable discloses a method and apparatus for enticing a passive television viewer by automatically playing promotional presentations of selectable options in response to the viewers inactivity.

5 The above systems are primarily restricted to the television medium and require specially developed interactive hardware, software and advertising formats.

Current interactive and direct or remote shopping regimes have indeed generated a myriad of complex consumer interface units and operating systems. Even the Internet as a shopping or ordering medium is difficult to navigate and is vulnerable to security breaches. Various hand-held devices such as palm pilots and modified television remote controllers are cumbersome, expensive and restrictively complex  
10 by being primarily directed to a narrow media band or information format.

It is therefore an objective of the present invention to provide an interactive information and multiple media system which will obviate or minimize the foregoing disadvantages of remote ordering and information transfer or which will at least provide the public with a useful choice.

#### SUMMARY OF THE INVENTION

15 A principal object of the present invention is to provide a simplified, convenient, secure and versatile automated electronic transaction system covering all forms of human interaction.

In accordance with one aspect of the present invention there is provided an electronic transaction system which comprises means for identifying one or more products, services or information quanta and means for rapidly recording a response to said identification of products, services or information quanta by  
20 means of a single action so as to associate particulars of the respondent with the identified products, services or information quanta as a basis for a present or future transaction.

The said means for recording a response may consist of a single switch closure or key-stroke.

The said identification of products, services or information packets may be a machine-readable signature, code or sequence.

25 Means may be provided for providing, displaying, disseminating or broadcasting said signature, code or sequence simultaneously with information relating to the product, service or information quanta and wherein telecommunication means is utilized to transmit a customer's response to the said provision.

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display, dissemination or broadcast together with particulars of the customer to a processing unit remote from the customer.

Some particulars of a control unit associated with a customer may be stored at a processing unit, the control unit being adapted to transmit said particulars together with identification of a signature, code or  
5 sequence to a processing unit via a telephone connection or other communication means. Additional particulars of a customer including personal preferences and financial details may generally be held in and used by a processing unit as and when appropriate.

The control unit may be adapted to store a signal associating the signature, code or sequence with the customer's particulars in response to a keystroke or closure of a switch for later transmission to the  
10 processing unit.

The provision, display, dissemination or broadcast may be a radio or television broadcast and the signature, code or sequence may be sonic.

Alternatively the provision, display, dissemination or broadcast is a television broadcast and the signature, code or sequence may be electromagnetic radiation.

15 Alternatively again, the provision, display, dissemination or broadcast may be printed or pictorial media and the signature, code or sequence may be a printed code or matrix transferable by means of electromagnetic radiation.

In yet another alternative the provision, display, dissemination or broadcast may be a physical display and the signature, code or sequence is electromagnetic radiation.

20 In yet another alternative the provision, display, dissemination or broadcast may be a physical display and the signature, code or sequence may be a printed code or matrix transferable by means of electromagnetic radiation.

In yet another alternative the provision, display, dissemination or broadcast may be a physical display and the signature, code or sequence may be sonic.

25 In yet another alternative the provision, display, dissemination or broadcast may be a visual display and the signature, code or sequence is a printed code or matrix transferable by means of electromagnetic radiation.



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In yet another alternative the provision, display, dissemination or broadcast may be a visual display and the signature, code or sequence may be electromagnetic radiation.

In yet another alternative the provision, display, dissemination or broadcast may be an audio visual display and the signature, code or sequence may be electromagnetic radiation.

- 5 In yet another alternative the provision, display, dissemination or broadcast may be print, pictorial, visual or physical and the signature, code or sequence may be magnetic.

In yet another alternative the provision, display, dissemination or broadcast may be print, pictorial, visual or physical and the signature, code or sequence may be electric.

- 10 In yet another alternative the provision, display, dissemination or broadcast may be print, pictorial, visual or physical and the signature, code or sequence may be infrared.

In yet another alternative the provision, display, dissemination or broadcast may be print, pictorial, visual or physical and the signature, code or sequence may be sonic.

In yet another alternative the provision, display, dissemination or broadcast may be television, video, radio, print, pictorial, visual or physical and the signature, code or sequence may be RF.

- 15 The control unit may be a hand held infrared remote control for a television, radio or audio visual set.

- In accordance with another aspect of the present invention there is provided a method of performing commercial transactions which comprises associating a machine-readable signature or code with an offered or advertised product, service or information packet, providing particulars of a customer in a device capable of reading said signature or code and responding to the signature or code in a way which associates said customer with said product, service or information packet so as to effect a transaction.
- 20

- In accordance with yet another aspect of the present invention there is provided a method of performing commercial transactions which comprises associating a machine-readable signature or code with an offered or advertised product, service or information packet, providing particulars of a customer in a device capable of reading said signature or code and responding to the signature or code in a way which associates said customer with said product, service or information packet so as to effect a transaction wherein part of the device is a telephone hand set.
- 25

In accordance with yet another aspect of the present invention there is provided a method of performing commercial transactions which comprises associating a machine-readable signature or code with an

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offered or advertised product, service or information packet, providing particulars of a customer in a device capable of reading said signature or code and responding to the signature or code in a way which associates said customer with said product, service or information packet so as to effect a transaction wherein part of the communication means is wireless.

- 5 In the method of the foregoing paragraph said response may be by telecommunication means to a processing or server unit at a location remote from the customer.

In any of the methods of the invention previously defined transaction data may be used to characterize and subsequently predict customer behaviour and/or to analyze and assist with production planning.

- 10 In any of the methods of the invention previously defined one or more merchants may accept orders from customers via an electronic data exchange or processing system, and/or credit may be provided to customers by a plurality of merchants via an electronic data processing system.

- 15 In accordance with yet another aspect of the present invention there is provided a multiple application electronic transaction system which includes means for storing information relating to a specific customer and allows that information to be used for a multiplicity of purposes including ordering items, enabling security functions and confirming approvals, authorizations and transaction for the said customer.

- 20 In accordance with yet another aspect of the present invention there is provided a multiple application electronic transaction system which includes means for storing information relating to a specific customer and allows that information to be used after customer-specific activation of the device for a multiplicity of purposes including ordering items, enabling security functions and confirming approvals, authorizations and transaction for the said customer.

In accordance with yet another aspect of the present invention there is provided a device for transmitting a data code to a processing unit, the device comprising:

- a media interface adapted to extract the data code from one of a plurality of mediums; and
- 25 • a gateway interface, coupled to the media interface, adapted to transmit the data code over a communication network to a processing unit.

The interface may include a remote gateway interface, adapted to communicate directly over the communication network with said processing unit.

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The gateway interface may include a local gateway interface adapted to communicate indirectly with said processing unit by way of a gateway that is coupled to the communication network.

The interface may include a modem adapted to communicate directly over the communication network with said processing unit.

- 5 The communication network may be a public switched telephone network ("PSTN").

The selection device may further comprise a media decoder adapted to convert an extracted data code into a digital value.

The device may further comprise a user interface, adapted to display information corresponding to the data code.

- 10 One of the said plurality of mediums may be a visual media, one of the plurality of mediums may be an audible media, one of the plurality of mediums may be a print media and/or one of the plurality of mediums may be a wireless media.

The media interface may include a bar code scanner, a microphone and/or an optical detector.

In accordance with yet another aspect of the present invention there is provided an electronic commerce

- 15 system for a user to select an item, the system comprising:

- a selection transceiver adapted to receive a data code from one of a plurality of mediums, wherein said data code corresponds to the item selected by the user; and
- a gateway, coupled to the selection transceiver, adapted to receive the data code from the selection transceiver and to transmit the data code.

- 20 The system of the foregoing paragraph may further comprise an information unit adapted to transmit the data code to the selection transceiver.

The information unit and the gateway may be within a computer.

The system may further comprise a processing unit, coupled to the gateway, adapted to receive the data code from the gateway.

- 25 The system may further comprise a transaction unit, coupled to the processing unit, adapted to complete a transaction between the user and a source unit.

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In accordance with yet another aspect of the present invention there is provided a gateway, coupled between a selection transceiver and a processing unit, comprising:

- a selection transceiver interface adapted to receive a data code from the selection transceiver; and
- 5       • a communication network interface, coupled to the selection transceiver interface, adapted to transmit the data code to the processing unit.

The communication network interface may include a modem adapted to communicate with the communication network.

10       The modem may be a mobile telephony modem adapted to communicate with a mobile telephony network.

The communication network interface may include a data network interface card.

In accordance with yet another aspect of the present invention there is provided a method for integrating a plurality of mediums comprising the steps of:

- extracting a first data code from a first medium of a plurality of mediums;
- 15       • extracting a second data code from a second medium of a plurality of mediums; and
- transmitting the first data code and the second data code to a processing unit.

The first medium may be a print media, a visual media, an audible media or a wireless media.

20       In accordance with yet another aspect of the present invention there is provided a device for facilitating electronic commerce transactions, said device having input means capable of receiving information from a medium, means for receiving an input from a user, means for storing the user's input in conjunction with information received from the medium and means for transmitting the combination of information and a stored value representing the identity of the user to a processing facility.

25       In accordance with yet another aspect of the present invention there is provided a method of conducting electronic commerce wherein a user responds to a sales promotion by pressing a button on a hand-held storage device which stores information about the user together with the user's reaction to a sales promotion identified by pressing the button, and the storage device is thereafter used to transmit

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information about the transaction including the user's details to a central facility for shipping and payment purposes and arranging for the dispatch of the goods or services chosen by the user.

In yet another aspect of the present invention there is provided an interactive personal ordering devices (hereinafter referred to as "POD"), small enough to be held on a key ring and which in general may be self-powered and portable to interact with one or more source information systems and forms of media such as print, radio, video, television, films, models, displays (including billboards), samples, demonstrations, live performances and the like (hereinafter referred to as "source media"), enabling the consumer to easily select goods, services or information packets (hereinafter referred to as "items") for ordering or consideration. The consumer / media interaction may include the reading of printed symbols or codes such as bar codes or matrix codes, detection of sound signatures, signals or patterns emitted by a speaker, detection of infrared codes, electromagnetic signals, magnetic, radio, video or light codes or other sources of information as may be appropriate to effect the customer selection of one or more items.

Typically the selection process is made in response to a promotion, advertisement or other source of information by way of a consumer, following an intellectual stimulation, (herein referred to as a "cerebral impulse"), activating a switch on a POD. The POD detects, processes and stores information from source media enabling the identification of the selected items as well as maintaining a selectable (alternatively) pre-entered record of the authorized user of the POD. The POD or equivalently a unique serial number identifying the POD may also require pre-selected security procedures to be carried out to enable its operation or to lock out unauthorized use thus eliminating the need for Personal Identification Numbers ("PIN") or passwords or it may alternatively require the use of PINs or passwords.

The POD communicates directly or via another interface with a processing unit or exchange to download codes, number or letter sequences identifying the selected items together with an identification of the POD or authorized user. Other information, such as the time of selection, may also be stored and downloaded. The downloading may take place at an arbitrary or selectable time or place in accordance with an instruction or action by the user. The downloading process can be arranged to rationalize the use of public telephony infrastructures thereby minimizing the cost and time of data transfer.

The processing unit processes the downloaded data, separating it into at least two parts, (i) the identification of the authorized user of the POD, and (ii) signatures identifying each of the items selected into the POD, or confirmed as selected into the POD after editing.

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The processing unit may also accept and process other data from the POD, such as the time of download, the time of each selection, whether the order is urgent and so on. It may also accept data from the interface, if separate from the POD, identifying the interface and accepting any other relevant information from the interface.

- 5 The processing unit then transfers such of this data and other customer details already stored as is relevant to merchants, promoters or officials to enable them to provide the ordered items to the customer. The processing unit may also provide or check customer credit, financial details, financial arrangements and the like and pass appropriate information to the merchant, or a bank or finance organization or otherwise carry out financial transactions to enable the completion of the transaction in  
10 accordance with pre-determined arrangements.

In addition, the processing unit may provide the customer with information directly or indirectly to confirm their order, to advise of merchants, choices and the like, and to advise of finances in relation to the system, as appropriate or as pre-arranged.

- Furthermore, the processing unit may be used to analyze and characterize buying patterns, customer  
15 preferences, behaviour and the like; to assist with production planning, distribution, display and promotion; to control or implement financial and banking functions; and to keep track of transactions and implement transactions based on other billing systems which may be used to generate revenue.

- It should be understood that the interactive POD includes circuitry and operating software and in one aspect of the present invention the circuitry is able to be inserted into and combined with other mobile  
20 devices, including mobile telephones, or pager devices which can form part of the present invention. In general a POD is intended to take the form of a miniaturized pocket shopping and ordering device applicable to a multiplicity of media.

- It is a function of the present invention to provide for the consumer an ordering system that can be used locally or remotely and which is high-speed, non-complex, responsive, and interactive with several or  
25 any media or information sources. It is furthermore a function of the present invention to provide for the consumer a simple, fast (c. 2 seconds) cerebral responsive interface with all forms of media including live presentations. In this regard the present invention provides the consumer with the ability to shop for and order items, respond to promotions or surveys, indulge in gaming, comply with regulatory requirements or even to vote. All this may be achieved with a one to two second activation of a switch  
30 on a POD which may, for example, be in the form of a small key-ring device, pocket device, or in a particular aspect, a television remote controller unit. Activation of one part of the present invention by

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and for the consumer is as easy as operating a remote door opener. however the present invention provides the consumer with multiple media and information interface choices for a wide range of activities.

5 It is a further function of the present invention to reduce the complexity and cost of electronic commerce by providing a low cost end-to-end system with limited requirement for human management of the process whilst at the same time providing a secure and convenient method of ordering and supplying items to consumers with accuracy and reliability.

10 It is an objective of the present invention to capture that brief moment in time where a consumer on seeing or hearing an advertisement, promotion or information about items, is able to, upon intellectual reflection, initiate automatic notification, to the promoter or merchant, of the consumer's interest or order for supply.

It is a further function, according to one aspect of the present invention, that responses may emanate from a single physical action instigated by a cerebral or human impulse such as the activation of a trigger switch.

15 The said impulse may be implemented by the action of closing a switch. In other cases, the impulse may find its implementation in the form of a gesture, speech, eye movement or other physical action and implemented by a diversity of mechanical or electronic means. Alternatively, the cerebral impulse may be detected by electronic devices outside of or inside the body and involve wireless or wired transmission to associated electronic devices.

20 It is a further function of the present invention to provide for the consumer a small lightweight interactive device whereby said device empowers said consumer(s) to responsively interact with one or more of but not limited to the following media or sources:

- print media (books, magazines, catalogs, newspapers, posters, advertisements, brochures, labels and the like);
- 25 • visual media (video systems, television, movies, films, pictures, displays, kiosks, tapes, disks, advertisements, infomercials, billboards, signs and the like);
- sound media (radio, voices, speech, sound, ultrasound, and the like);
- physical media (models, samples, exhibits, demonstrations, displays, shows and the like);

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- sensory media (smell, touch, taste and the like);
  - electromagnetic media (magnetic or electric or electromagnetic fields, electromagnetic waves, and modulated waves including radio waves, microwaves, infrared waves, light waves, ultraviolet light and soft X-rays and the like); and
- 5      • multimedia (computers, the Internet, complex systems, or combinations of any of the above media).

It is a further function of the present invention to provide for the consumer, by way of a POD or similar device, an operative cerebrally responsive switch that allows for the detection of various impulses in response to media promotion or information resulting in, but not limited to, the up-loading of product  
10 signatures such as characters, bar codes, grey tone codes, matrix codes, symbol codes, image codes, video codes, audio codes, magnetic codes, electric codes, electromagnetic codes, or any combination of such codes and for said device to process said codes in order to store associated or equivalent number or letter sequences with a singular action.

In addition, a POD device may be used for a multiplicity of security, information, banking, payment and  
15 authorization purposes based on identifying the authorized user. For such applications a POD can eliminate the need for PIN numbers such that the activation may persist for a time limited period and be capable of locking out customer usage if incorrect activation is repeatedly attempted.

It is a function of the present invention to provide a device which, in response to a further singular activation, provides for the transfer and or processing of recorded or stored data, including such other  
20 data as may signal consumer or user intentions and identification, to a remote data processing system by communication means which may include wired or wireless or otherwise interactive transmitters and receivers.

The present invention alternatively provides for the consumer an interactive interface unit hereinafter referred to as a "Household Interface Unit" ("HIU") which likewise is responsive to an engagement,  
25 trigger or switch, be it direct or indirect, from the consumer upon which the said device automatically transfers such necessary data to record and process a cerebral impulse response to a media promotion to a data processing and billing system in order to obtain, purchase or provide the associated item(s) for the consumer independent of the consumer's time and location.



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The present invention is also able to provide for the consumer an interactive interface unit hereinafter referred to as a "Commercial Interface Unit" ("CIU") to enable active financial responses and transactions to be recorded or transferred from commercial or other premises, including merchants, and to be processed at or by the said processing unit. The said CIU may also provide access to financial instruments such as cash, checks or notes following interaction with a POD and a processing unit.

In a further aspect of the present invention there is provided a high speed data transfer system compatible with standard PSTNs whereby data generated by use of components of the present invention including a POD, HIU or CIU, is transferred to a processing unit at random or pre-selected times by way of a high speed dual tone or phase shift transfer method. In this regard the present invention provides for data transfer in a manner which is compatible with, and not destructive or interruptive of, a PSTN. The present invention by this form of transfer further limits the time needed to transfer relative data by eliminating some sequences such as synchronization of signals from the data transfer process as is common with conventional data transfer systems such as fax modems and/or Internet protocols.

The present invention enables more effective and efficient advertisements to be provided. Advertisements associated with items that can be ordered with the invention may be used to convey information that allows a customer to make and implement a decision during or shortly after the advertisement is displayed. This removes the need to make advertisements simplistic, repetitive and intrusively prolonged. Because advertisements associated with the invention can be more effective, less advertisement time is required for the same benefit. Therefore entertainment containing advertisements need no longer be compromised by numerous prolonged advertising interruptions as is presently the case.

In yet another aspect of the present invention there is provided a method of media advertising whereby merchants and promoters formulate content of said media advertisements or programs to communicate singly or simultaneously with electronic appliances, including PODs, whereby said appliances are interactive and communicative with said advertisement or promotions which may include such signals, codes, characteristics and images identifiable by electronic or machine reading of said signature code images or characteristics.

According to another aspect of the present invention, billboards, displays and other promotion devices may be configured, or associated with a device which is used, to emit infrared, RF or other electromagnetic or sonic signatures which are acceptable by POD or HIU devices. This allows customers to order the promoted items using a POD or similar device. As a result, billboards and public

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spaces which can be used for displays and promotions can become interactive with the business method of the present invention. In this aspect of the invention, a billboard includes a sign or display in any public or private place.

5 In yet another aspect of the present invention there is provided a transmitter or source device which is typically small and mobile. Such device is interactive with POD or HIU type units. The aforementioned transmitter can be attached to any display, model or building. If a merchant or consumer is for example promoting a motor vehicle for sale, such transmitter display may temporarily be attached to said vehicle whereby it continuously transmits a signature code readable by a POD or HIU, mobile telephone or similar apparatus equipped with the circuits and controllers of said POD and HIU. The transmitter or  
10 source device may emit RF, optical or infrared radiation. In other examples, the source may be sonic.

In yet another aspect of the present invention there is provided a POD which is wireless enabled to communicate with other personal appliances including other said PODs, telephones including mobile and cellular, pagers, palm pilots and mobile computers.

15 In yet another aspect of the present invention there is included a POD which includes circuitry capable of receiving pager messages.

A further aspect of the present invention provides for the consumer the ability to clip directly or indirectly sufficient data from any broadcast or source signal or program including news items, documentaries, sports broadcasts, entertainment and quiz shows whereby no encrypted signatures are required as part of the broadcast signal. The present invention in this regard is able to clip a segment of  
20 the signal and transmit a cipher code that is able to be forensically matched to the particular broadcast. The present invention in one aspect provides this facility by recording a minimum sample of the broadcast signal and transferring that sample in numeric or other forms to the processing unit. The processing unit in this regard may transfer such signals to a manually operated review unit for identification and matching.

25 In yet a further aspect of the present invention visual encoding can be separated into two distinct coding techniques: perceptible and imperceptible. Perceptible data codes are apparent to the user. Imperceptible data codes are not. Methods of acquiring the code from the visual medium can include interception of video signals. Perceptible codes can include blanking, color codes, intensity modulation, or a combination of the three coding schemes. Blanking is achieved by using an image or part of the image,  
30 which goes blank (e.g. black) for a specified time corresponding to the code to be transmitted. With color codes, the image or part of the image may show a specified color sequence corresponding to the

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code to be transmitted. A sequence of colors in an image or part of an image may thus correspond to a data code transmitted. Intensity (e.g. brightness) of the image or part of the image is modulated in accordance with the code to be transmitted. A combination of blanking, color coding, color sequencing and intensity modulation may be used over the entire image or part of the image to transmit codes.

- 5 Imperceptible data codes include blanking intervals, which encode video images. In this technique data is encoded into the blanking interval of the video signal, similar to the technique used for Teletext.

- In another aspect, the present invention provides for low cost merchant / consumer interaction by removing some aspects of the merchant expenses relating to product storage, delivery and other overhead costs. For example, a merchant may prepare a direct promotion that is machine-readable by
- 10 any of the devices and systems of the present invention and to which interactively the consumer responds thereto by faster means than present systems allow. In this regard, because of the rapid nature of the consumer response notification, the merchant quickly becomes aware of the number of items ordered. Because of the rapid response nature of the present invention the merchant is able to safely confirm the number of items needed to be manufactured and delivered prior to issuing a final order to
- 15 the manufacturer. For example, a new technology product such as a cordless iron may normally retail for around \$60.00 at a conventional retail outlet. The actual cost of the iron delivered to a port of entry from a manufacturer may be no more than \$7.00. The merchant can therefore, with the use of the present invention, arrange to import say one forty foot container, holding approximately 6,000 irons at a cost of \$42,000 (landed) . The merchant, using the present system of the invention is able to provide a
- 20 significant discount from the comparative \$60.00 down to say \$30.00. The promotion would be designed to attract an impulsive response from a consumer, in possession of say a POD unit, by clearly showing that there is a substantial discount available therefore the response numbers are more likely to be higher than a normal advertising campaign for the same product. Most importantly, the merchant would receive satisfactory indication from the consumer market as to how many irons are required by
- 25 consumers before a final shipping notice needs to be issued to the manufacturer. On receipt, the merchant need not even unload and store the containerized goods, as the process of the present invention allows the merchant to automatically generate delivery instructions to a delivery company or system whereby the goods can be obtained directly from the container and delivered directly to the consumer thereby eliminating the need for expensive storage and low impact advertising campaigns.
- 30 Thus it can be seen by the above example that there is a benefit in commerce efficiency to both the consumer and the merchant.

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In one embodiment of the present invention, the information source can include a television station, a radio station or a distributor of content (e.g., video cassette distributor, CD-ROM or digital video disks (DVD) distributor, motion pictures distributor, public billboard providers or print publication distributors). One skilled in the art will recognize that this list of examples of information source units is illustrative and merely intended to demonstrate that the system is so adaptable that the information source unit can be any type of distributor of content.

In another embodiment of the present invention, the information can be a consumer electronic device (e.g., a television or a radio), a public display (e.g., restaurant menu, billboard or flyer) or a publication (e.g., book, magazine or catalog).

10 In an alternative embodiment, the POD can be emulated via software within a personal information device such as a palm pilot device or a mobile wireless (e.g., digital or analog) telephone. This alternative embodiment also is easy to manufacture and distribute to a large group of users, such as via the Internet or via other software distribution mechanism. One of the advantages of this embodiment of the POD is its simplicity. By placing very simple circuitry within the POD and the bulk of the complexity of the system within the processing unit, the system can ensure that the POD is a simple and inexpensive device for use by the user. The same concepts can be used to ensure miniaturization of the POD to an easily portable pocket device.

One embodiment of the data packet transmitted by the HIU or CIU includes an identification information field, a data code field and a date/time field. The data code field can include information associated with a specific item (e.g., product or service) or a specific channel (e.g., TV or radio channel). The date/time field can be used to supplement the data code field to allow the processing unit to cross-reference the data code field with the data code field and determine (e.g., in the visual media context) that the item corresponds to a data code that was transmitted on a certain day and time via the information source (e.g., via a television broadcast signal). The identification information field can include identification information about the user, the POD and/or the HIU or CIU, which can be used for identification and security purposes. One skilled in the art will recognize that alternative embodiments of the data packet can include additional fields or the fields can include additional information, which can be processed by the processing unit. Such additional information can include the size, color or model of an item. In addition, the data packets can be transmitted to the processing unit in various different forms including binary electronic signals and/or dual tone multiple frequency ("DTMF") tones.

The POD can provide additional functionality to the system. For example, the POD can serve to provide credit card verification (e.g., Visa, MasterCard or American Express), account verification or loyalty incentive program services. One skilled in the art will recognize that the functionality of the POD also can be incorporated into the processing unit or the HIU or CIU. One skilled in the art also will recognize this system can be either partially or completely bi-directional, thereby allowing one or more of the information source, the POD, the HIU or CIU, the communication network, the processing unit, any associated computer or PC, and the world wide web to communicate with one another as well as with the user.

A PC or computer, thereby, allows a user to use the computer to allow the POD to interface directly with a world wide web page, which is displayed by the computer or PC screen. For example, a user can view information (e.g., a three-dimensional graphical display of an item) on the screen and select the item associated with that information, which the user is interested in (e.g., for purchasing). Upon selection of the item by activating the POD, the latter interfaces with the HIU and transmits a signal, which instructs the processing unit to perform a specific routine (e.g., processing an order).

An alternative embodiment of the present invention can allow a user to use the POD in conjunction with a computer via the world wide web or Internet for identification or verification purposes. In particular, by activating the POD, the user would be able to check the status of items previously selected by the user (e.g., purchase order) or to check the status of the user's personal account (e.g., bank account or credit card account). The POD in this embodiment could be used to automatically input into the computer via an infrared protocol ("IrDA") port to enable or obtain user account information, identification information or a government identification number (e.g., social security number).

In one embodiment of the present invention, print media can include catalogs or newspapers. The visual media can include transmissions (e.g., broadcast signals) from (cable) television, video home system ("VHS") cassettes, digital video disks ("DVD"), video compact disks ("VCD"), compact disk – read only memory ("CD-ROM"), motion picture films and video streaming over the Internet. The audible media can include (broadcast signal) transmissions from the radio, audio associated with the visual media or compact disks ("CDs"). The wireless media can include radio frequency identification ("RFID"). One skilled in the art will recognize that these examples of different mediums are not exhaustive and that any medium or mechanism for disseminating information to the user can be implemented into this system.

In one embodiment of the present invention, the system utilizes a transmission of a data code, which is associated with the information disseminated by the information source wherein the data code provides specific information regarding the item within the information that is being selected by the user. For example, the data code can include information related to what options (e.g., quantity, size, color and model) are available for a selected item. In addition, the data code can include information regarding other information (e.g., television or radio channel upon which the information was disseminated or the specific advertisement displayed to which the user responded in selecting the item).

If, however, there are no options available within the data code for the item selected, then the processing unit can prompt the user via the associated or independent communication means (e.g. the telephone) to contact the consumer to select an option as desired. In one embodiment, the options associated with each data code can be pre-programmed into the processing unit which can cross-reference the data code with the corresponding options to assist the user with completing his selection of the items.

In one embodiment, the POD can utilize an optical detector, such as a lens and an electronic driver, to detect such coding schemes as bar codes, two-dimensional matrices, silicon ink or character recognition or visual media. Bar codes are printed as a series of vertical or horizontal lines and spaces, which can be of varying widths or spacing. Examples of bar codes include Barcode 39 and UPC product codes. In one embodiment, a light emitting diode ("LED") or other form of light source within the POD illuminates the code underneath the aperture or lens within the information source media and a light dependent resistor or other form of light sensing device receives reflections from the printed media. The output of this light sensing device is forwarded to circuitry within the POD or the HIU or CIU or other means in order to convert the data code into a suitable digital format, which can be stored within the random access memory ("RAM") memory of the POD or HIU or CIU. An alternative embodiment of interpreting these codes is to use a linear charge-coupled device ("CCD") array. An aperture in the POD is placed and held over the printed bar code. The code is illuminated via LEDs or some other light source and a single line image is captured by the linear CCD array and the media decoder within the POD decodes that information and stores the data code within its RAM memory.

Two dimensional matrices typically include black and white segments, which allow a higher density of information to be printed in a smaller space on the print media. Such a code then can be interpreted by swiping a linear CCD device, which is included within the POD, over the printed two-dimensional matrix code. By obtaining successive single line images of the code as the CCD is swiped across the printed code, a two-dimensional image can be obtained by the POD and processed within it to determine the data code. An alternative technique for interpreting the matrix includes using a two-dimensional

CCD device, which can be included within the POD. An aperture in the media interface of the POD is placed and held over the printed two-dimensional matrix code. The code is illuminated via LEDs or some other light source and a two-dimensional image is captured by the CCD sensor. This coded information then is processed to determine the appropriate information.

- 5 Another coding scheme is to rely upon a capacitively or radiatively coupled RFID system (e.g., a 'BiStatix'™ System) where the aerial of the system is printed on print or other source media using a conductive ink. A small silicon device is connected to this printed aerial, which stores the information including data codes and can transmit that information back to a BiStatix™ reader, which can be incorporated into the POD or HIU or CIU.
- 10 Yet another coding scheme for print media is to use character recognition. A suitable sensor (e.g., linear or two-dimensional CCD) included within the POD could scan text, which then can be processed by optical character recognition ("OCR") software within the POD processing system to determine the data code.

- The POD also can extract data codes from visual media, such as CD-ROM images or television images, which are displayed by an information unit, such as a television or video screen. In one embodiment, the television signals can be used to carry the data code associated with a specific item that can be selected. In this technique, frames, lines, segments of pixels or the entire visual display can be used as a vehicle for the data code. In such an embodiment, the POD, as a media interface, can include an optical detector, which analyzes the images that are displayed on the information unit. In particular, the POD, or an associated device, can detect the data codes by sensing radiation or fields emitted by the information unit, such as the line sweeps, frame sweeps or other pulses or changes in the transmission (e.g., broadcast signals) by the information unit. Alternatively, the POD, HIU or an associated device can attempt to detect a block of one or more pixels (e.g., dynamic data code) in an identified area of the TV picture, which is detectable by a light detector placed upon or near that part of the TV screen or which is focused onto that part of the screen.

- In various embodiments, these various types of coding can include data codes associated with the selected item as well as date information, time information and channel information regarding the television transmission. With this type of data code, a processing unit can not only can respond to the selected item (e.g., deliver a product or service to the user), but also can use this data code to determine as to what the user is responding when selecting the item associated with the data code (e.g., a specific advertisement on the television or to a specific product placement within a television program). One

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skilled in the art will recognize that the other mediums also can have this additional information associated with the data code to assist the processing unit and the source unit to obtain additional information regarding the user's behavior in selecting the item.

One skilled in the art also will recognize that to communicate the availability of a data code within a visual media, such as television, a static or dynamic (e.g., animated) image can be displayed on the visual media to alert the user that the data code is available for reception by the selection transceiver. For example, when a user watches a television program with a product placement evident on the screen, an animated icon can be illustrated at the lower right hand corner of the screen to illustrate that the product is available for selection because data codes are currently being transmitted.

10 With regard to an embodiment where the visual media is a CD-ROM, the CD-ROM can contain one or more complete catalogs of items including prices and appropriate information, which is offered by one or more sellers, such as a chain-store, a supermarket chain or other type of vendor. There may be different CD-ROMs for different types of items or for different sellers or groups of sellers. The information placed on the CD-ROM may further include advertising, games, demonstrations of items, specification of items, prices of items, and other relevant information. Each item offered for sale on the CD-ROM is encoded with a data code, such as a unique number which can be represented by a conventional bar code (e.g., UPC). In an alternative embodiment, this bar code scheme can be augmented by additional code numbers, letters or identifiers in order to specify additional information such as the source unit associated with the item. This information is stored on the CD-ROM with directories and searching facilities in a manner that facilitates the searching by categories of various types and by identifications of various forms so that a searching process can quickly and efficiently locate any desired item.

For audible media, the POD media interface can include an audio receiver (e.g., a microphone), which detects data codes embedded within the audible media, such as a transmission that is part of a television or radio broadcast or a video or audio-video display. Similar to the visual media, it may be beneficial if an existing broadcast of the audible media could be modified so that additional data can be conveyed over the carrier wave without interfering with the primary transmission of the original data, which was the purpose of the broadcasting system. In particular, data codes can be introduced into the audible media in such a manner that the HIU or processor unit can identify what audio track is being received. In addition, a number of parameters of the audio track can be analyzed generating a set of parameters for that particular audio track. This information then can be correlated with the appropriate data code in the processing unit.



Like visual encoding, audio encoding also can be separated into perceptible and imperceptible data coding schemes. Perceptible introduced audio data codes include DTMF where a sequence of standard DTMF tones corresponding to the code being transmitted are incorporated into the audio track. Alternatively, additional frequencies can be used for encoding the audio signals. Data codes also can be  
5 encoded using tone duration, sequence of tones, frequency modulation ("FSK") space duration and the frequency (or range of frequencies) present within the tone or tones to encode data codes within the audible media. In addition, audio muting can be used where the audio track is muted for a period of time corresponding to the code being transmitted. Alternatively, a sequence of muted audio could transmit the desired data code.

- 10 One example of the encoding of data codes within the audible media signal can rely upon the starting of a clock at the commencement of the encoding at the information source unit or the information unit, and which also can be used to start or synchronize a similar clock at the corresponding position or time within the POD or HIU, whichever is the decoding point. At each clock transition, the next positive peak of the waveform can be artificially increased in amplitude so that it exceeds a particular permanent  
15 or transient threshold for the purpose of generating a "1", or be reduced below another different threshold for generating a "0". Alternatively, irrespective of the original waveform, a short, narrow pulse can be inserted at a pre-set time after the clock transition to signal a "1". This pulse may be of, or above, a particular fixed threshold, or the threshold may be with respect to some average amplitude of the original signal. The absence of such a pulse is a "0". The termination of the data code can be  
20 signalled by standardizing the code length, by a particular data code symbol, or by the use of a different pattern above or below the respective thresholds.

- In an alternative embodiment of the encoding of the data code, the coding may consist of using a clock synchronized with respect to a particular starting point on the waveform to select points of the waveform which are precisely related to each transition of the clock. At each such point on the waveform, a pulse  
25 of specific amplitude and width is inserted such that the amplitude or the width of the inserted pulse has a specific meaning. For example, there may be five possible widths or amplitudes of each inserted pulse which can be inserted that correspond to the numbers "0" to "4". In an alternative embodiment of the present invention a single pulse of appropriately high amplitude may be inserted into the waveform at a variable time after each clock transition wherein the position of the pulse with respect to the clock  
30 transition represents a number, either binary number ("0" or "1") or within a set such as "0" to "4". By setting the clock period to be relatively long compared to the average period in the waveform, distortion of the original wave can be minimized and the effect of the addition of the data code would not be

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obvious to most users. The preferable length of the clock period is variable, depending on the implementation and the amount of distortion of the original data that is acceptable.

The primary signal can be encoded with more than one set of data codes by passing this primary signal through successive processes where different clocks of different periods are successively used to  
5 determine the position of appropriate waveform peaks and to either enhance or decrease their amplitude to create the desired selection of "0"s and "1"s, or of amplitudes, widths, or positions according to the method used. Correspondingly, decoding by the POD or HIU may be achieved by the use of different clocks periods for each second data set. This may be used to enable different users, perhaps in different locations, to decode different sets of second data streams from the same broadcast signal.

- 10 One skilled in the art will recognize that, even though following discussion of embodiments of the present invention discuss the encoding and decoding of data codes from signals, which are additional to existing signals transmitted by the information unit, other forms of dissemination of the data codes, which either exist or are developed in the future, can be used with the system of the present invention.

Imperceptible introduced audio data codes also can be used to encode within the audible media.

- 15 Imperceptible codes involve modulation of the audio signal that does not alter the sound heard by the human ear. Such techniques can include phase modulation, selective filtering or the introduction of audio components beyond the hearing range of the human ear. An additional technique is audio signal analysis, which involves identifying an audio track by measuring one or a number of parameters associated with a sound track. By carefully selecting these parameters and the audio tracks to be  
20 encoded, a set of unique parameters specific to particular sound tracks can be generated and detected by the POD or HIU in order to communicate the data codes. These techniques may be applied to the entire audio track, a segment of the audio track or multiple segments of the audio track of the audible media. An additional technique for the audible media is track duration where the duration of the track is measured by the POD or HIU. To implement this technique, a start and stop tone may be needed within  
25 the audio track. Level detection is an alternative encoding scheme where the sound level of the audio track can be monitored and from this unique parameters generated. Implementation of these techniques can include analog detection, digital signal processing ("DSP") or a combination of these techniques.

- An alternative embodiment of the detection technique is peak amplitude detection. In this method, the peak amplitude of the auditory signal of the audible media is measured for a number ("n") of given time  
30 intervals ("t") following detection of a trigger signal. This will provide a set of n peak levels. An alternative encoding technique is average amplitude detection where the average amplitude of the audio

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signal is measured for a number ("n") of given time intervals ("t") following detection of a trigger signal. This will provide a set of n average levels. An alternative encoding scheme is multiple level detection where the amplitude of the audio signal is measured for a number ("n") of given intervals ("t") following the detection of a trigger signal, and determine the time for the interval t that a threshold or  
 5 number of thresholds ("nT") were exceeded within that interval. An example of this would be a set of four thresholds: the average level 1, 2 x 1, 3 x 1 and 4 x 1. The detection algorithm would determine the percentage of time the audio level exceeded each of these thresholds within each of the given time intervals producing a 4 x n matrix of values.

With regard to frequency analysis, the frequency content of the audio track can be analyzed and from  
 10 this a unique set of parameters generated corresponding to that audio track. In this method, the audio track would be passed through a number  $n_F$  of audio 'notch' filters. This would essentially produce  $n_F$  audio tracks with frequencies that are limited to the pass band of each of the filters. These frequency limited audio tracks can then be processed by appropriate level detection circuits producing a set of  $n_F$  level parameters for each time slot. An example of this, using the multiple level detection method,  
 15 would produce a three-dimensional  $n_F \times n_T \times n$  matrix of values corresponding to audio track. By carefully choosing  $n_F$ ,  $n_T$ ,  $n$  and  $t$ , a statistically unique matrix can be determined for specific audio tracks.

Another alternative embodiment relates to the POD or HIU media decoder including voice recognition capability in order to decode speech, which was within the audio track of the audible media received by  
 20 the media interface within the POD or HIU. The media decoder, therefore, will be able to produce a script of the track, or part of the track, which then can be used to determine the data code embedded within the audio track. A voice recognition system has the ability to interpret audible speech. The media decoder would accept the audio signal from a microphone or line connection within the POD or HIU and process the signal using a digital signal controller ("DSP") system. From this signal, the DSP  
 25 system would generate a word list corresponding to script of the audio signal. This word list or script could be used to cross-reference the specific advertisement or message, which triggered the user's response, thereby resulting in the identification of the data code.

For wireless media, a radio frequency identifier ("RFID") tag can be associated with the a signal that is transmitted by the information unit and received by the media interface of the POD or HIU. In this  
 30 embodiment, the media interface can be a transceiver, which receives radio frequency signals. The wireless media (which can include infrared as an alternative to RF) can be used in many environments including within a movie theater, exhibit, show, stadium and other public venues. The wireless media

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then could be transmitted throughout the environment and be received by the PODs or HIUs that are activated by certain users.

One skilled in the art will recognize that in addition to the above referenced coding schemes, other types of schemes can be used with the various mediums including additional variations of amplitude modulation ("AM"), frequency modulation / pulse modulation ("FM/PM"), pulse width modulation ("PWM"), pulse amplitude modulation ("PAM"), and pulse position modulation ("PPM") applied to RF, microwave, optical or infrared signals. In addition, one skilled in the art will recognize that the above description of alternative embodiments of media interfaces are merely intended as illustrative examples. One skilled in the art will recognize that the media interface can be adapted to receive any type of medium, which is transmitted by the information unit.

Such an embodiment may include sound or video dubbing, which is incorporated into the television or radio broadcast or embedded within a video (e.g., VHS or DVD) transmission or onto video, audio or audio-visual storage media (e.g., CD-ROM or CD), wherein the dubbing includes data codes that may allow the POD or HIU to detect and read the said data codes, when the user selects a specific item that either is being displayed or discussed. The dubbing may take the form of coding by means of altering certain pixels or blocks of pixels, scan lines or part of such lines, or frames or parts of such frames, or by dubbing sounds onto a sound track or information onto a carrier wave. When dubbing the audio signal, this may be at an inaudible frequency or amplitude or may be otherwise masked within the sound pattern. Video image dubbing can include symbols (such as words, letters or numbers) which can be detected by pattern recognition scanning or detection devices. Dubbing or encoding also may comprise the use of a repeated pattern, unique to the product, which can be detected and decoded in the first device. For example, this may be a pattern of sound, or of light, color, shapes or symbols. The extraction of the data codes also can be accomplished either directly by the POD or by triggering the HIU, which can be directly transferred to the processing unit, to extract the data codes directly from the transmission upon receiving an activation signal (e.g., the double click of the "mute" button) of a POD.

In addition, the data codes can be designated as being available for receipt by a POD by displaying a static or animated picture on the screen. This picture can represent the periods of time during a broadcast that the item is available for selection because the data codes are being broadcast within the signal. The typical frequency range of such sound waves is of the order of 100 Hz to 10 kHz. An advantage of using such sound waves is that the coding scheme can be done on the sound prior to modulation, and therefore the encoding can be used on all types of sound broadcasts. Similarly, the decoding by the POD can be achieved in the same manner by receiving a demodulated signal, which is

independent of the method used to modulate and transmit the original data to the information unit. The clock frequency can be generated at the POD or HIU by an oscillator of the same frequency as that used at the information unit. The clock can be initiated or synchronized by a tone, combination of tones or set of pulses or pre-selected combination of second (e.g., coded) data which can periodically be transmitted with the original broadcast data to the information unit and re-broadcast to the POD or HIU. In such a scheme, each value "1" is signalled by inserting a fixed amplitude and fixed width pulse a fixed time after the clock transition. The insertion can be by dubbing, but it would generally be preferable to interrupt the waveform and insert a fixed width pulse of appropriate amplitude to represent either "0" or "1" as required. When an audible media is used, which has a bandwidth of 10 kHz, the pulse width typically would be of the order of 25 microseconds, while the clock frequency could be of the order of 100 to 500 Hz. The amplitude of the pulse of "1" may be of the level of the maximum amplitude permitted in the system, with the original data of the audio system configured so that no other audio amplitude is greater than 95% of the maximum permitted amplitude. Decoding by the POD or HIU media decoder can include a comparator, which is triggered by each transition of the receiver end clock and which includes the correct delay to ensure that the comparator detects the center of the code pulse. The decoded pulses ("0" or "1") are stored in a buffer and processed as required to convert the binary coded data into intelligence as required by the particular application.

Once the items have been selected by the user, the list of data codes (e.g., in the form of a text list) can be reviewed by the user on either the POD or the HIU before the data codes and identification information is transmitted to the processing unit. In addition, a personal identification number ("PIN") can be in-put into either the POD or into the HIU or CIU to identify the user. Such a confirmation of identification will allow the POD and/or the HIU or CIU to confirm or deny the user access to or selection of the items in accordance with pre-established criteria. If the identity of the user is confirmed and the user confirms the selection of the items, the data codes associated with the selected items and identification information is forwarded to the processing unit.

The processing unit receives the transmission from either the POD or the HIU or CIU via the communication network. In one embodiment of the present invention, the processing unit includes various ports, which allow the processing unit to receive transmissions from various different types of communication networks. After the processing unit receives the selection data, the processing unit confirms the security of the transmission. In addition the processing unit determines the corresponding source unit to which the data codes are associated as well as initiates a transaction process to confirm that the user pays for the selected item (e.g., good or service) before the merchant or supplier fulfils the selection (e.g., delivering the product or service to the user). The transaction process either can be a

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third party payment scheme (e.g., credit card payment), which is typically achieved by the processing unit (e.g., VISA) or can be a process, which the processing unit has the capability of completing (e.g., debiting a user's account). One skilled in the art will recognize that in alternative embodiments the transaction functionality can be implemented at any point within the system.

- 5 In processing the selected data by analyzing the data codes, the processing unit is able to associate the unique data codes with the specific source units associated with those data codes. Once the identification is made and the data code is converted into a specific code for a specific item for a specific source unit (selection code), the selection code is transmitted to the specific merchant, supplier or source unit for fulfilment. Details for the supply and delivery of the said items also can be included
- 10 within the selection code. This selection code can be a code pre-designated by the source unit, which is stored within a database within the processing unit and portrays as much or as little information about the selection as the source unit desires. Alternatively, the data code is a code, which is matched with the pre-designated selection code that the processing unit pre-designates as associated with an item as well as other information to allow the processing unit to not only match the selection of an item with a
- 15 specific source unit or merchant and accompanying selection code, but also to obtain additional information such as time of the selection, type of media the selection was made from and any other potentially useful profile information that can be used at a later date to characterize the behavior of the user and the overall use of the system.

- Once the selection code is transmitted to the appropriate source unit or merchant, the source unit fulfils
- 20 the selection based on the selection code and the user identification information, which the processing unit has associated with that selection code. In addition, a confirmation (e.g., written or electronic) can be sent (e.g., transmitted or posted) back to the user via the processing unit at any time to alert the user that the selected item has been fulfilled by the source unit.

- In an alternative illustrative embodiment, the information unit can be included within a computer with a
- 25 screen that is coupled to a video source (e.g., DVD or CD-ROM player). The screen has the capability of displaying images and sounds of an interactive catalog of items that the user can select. In addition, the information unit can provide games, prizes, coupons, draws and other mechanisms to attract users and to encourage or persuade users to select particular items. Different organizations can provide their own CD-ROMs or DVDs to users either via conventional mail or electronically via the Internet.

- 30 The POD or HIU or CIU also can include software that can provide additional information, options and controls for the user. For example, this software can allow the user to check the selected items against

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pre-programmed schedules, preferences or patterns to ensure that they are within the profile, and if not, carry out checks and interaction with the user for verification that the user intended to select that specific item. The software also can prepare cost, match the orders with account statements and select options for payment. The software further can provide the user the ability to search source units (e.g.,  
5 merchants) of selected items and find the cheapest, nearest, quickest or otherwise preferred source unit.

Once payment information is provided, the computer allows the user to denote the urgency, delivery options and any other relevant information. When this is done, the user can confirm the user's decisions and indicate that the selection is complete and should be transmitted to the processing unit. The order then can be transmitted, processed and the items delivered to the user. The user typically would receive  
10 a confirmation message that the selection of the items was received, and later a confirmation that the source unit has fulfilled the selection.

One skilled in the art will recognize that such a system can be used not only to order products or services from interactive catalogs, but also to select items from live television advertisements, booking of services, payment of taxes, selling of items, and any other type of transactions.

- 15 In an alternative embodiment, the system can be used outside the home in a commercial environment, such as a physical restaurant or store. In this environment, the information unit can be a menu or a display. In the restaurant environment, a user could review a menu and determine what items he wishes to select for consumption. The user then would proceed to activate the POD and scan a bar code corresponding to each item he wishes to select. In this paradigm, the user does not have to wait in line or  
20 for a table before selecting the items he wishes to eat. In the home environment, once the POD was used to scan the items on the menu, the food (e.g., pizza) would be delivered to the home from a local restaurant. In the non-home environment, once the user reaches the front of the line or a table becomes available within the restaurant for the user, the selected items (e.g., food) would be ready for consumption by the user.
- 25 In the store environment, items secured by the store (e.g., pharmaceuticals) can be selected by a user scanning a bar code associated with the item desired. In this manner, the user's identity, desired item and whether that user is authorized to obtain that item are confirmed before the user even needs to speak with a store employee. For further security, the user then can be required to enter an additional PIN at the register when he is provided with the item to further confirm the identify of the user. In one  
30 embodiment, this mechanism can be used to maintain the security of items, such as alcohol or cigarettes, which are only intended for users, who are over a certain age.

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In yet another embodiment, the POD may be used as a payment vehicle. In this embodiment, goods or services are selected using conventional selection methods (e.g., bringing a product up to a check-out booth). Upon determining the total payment due, the user can activate the POD to interact with the CIU via the communication network and processing unit. Another alternative embodiment of the system is using the system for bill payment. Either a physical bill or an electronic statement is sent to the user. In the physical bill context, the user then would scan the bar code on the bill with the POD and confirm with the HIU or CIU that payment of this bill should be made. Alternatively, the user could access that bill via a world wide web-based Internet inquiry system or via the receipt of an electronic bill (e.g., e-mail). Upon either receiving the electronic statement or upon logging into a world wide web Internet site, which stores the electronic statement, the user activates the POD to confirm that payment should be made. The payment then will be made to the source unit (e.g., gas or electric utility service) via whatever payment mechanisms the user has already identified to the processing unit for that particular source unit (supplier). In the electronic paradigm, the user will use the POD to interface with a computer, which will result in a secure transmission to be sent to the processing unit. In such embodiments, the communication from the computer to the processing unit can be secured by sending a secure text transfer protocol ("STTP") packet to the processing unit. The payment will be made to the source unit via whatever payment mechanism the user has designated with the processing unit.

Alternatively, the bar codes on the actual items (e.g., box) also can be used to extract the data code associated with the item. When a user decides to select (e.g., purchase) an item (e.g., hammer), the user would retrieve the item desired to be selected, scans either the bar code associated with the item and brings that item to the front of the store. When the data code associated with the item is extracted from a bar code, the item will be displayed on a screen at the front of the store when the user approaches and provides the store staff with a user identifier that associates the user with the selections. The selected item then can be displayed for the user to confirm that this item is what was desired and also displayed for the store staff to ensure that only those items selected will be allowed to leave the store. Alternatively, the user could review this selection at a monitor within the store and confirm that the desired items were selected in the proper quantity. When the user reaches the front of the store, the staff member of the store merely needs to confirm that the items selected and purchased correspond to the items the user is leaving the store with.

Turning now to a more detailed description of the invention.

To those few skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from



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the scope of the invention as defined in the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

The accompanying drawings, that are incorporated in and constitute a part of this specification, illustrate various embodiments of the present invention by way of non-limitative example.

**Figure 1** is an illustration of an end to end interactive multi-media ordering system in accordance with one embodiment of the present invention;

**Figure 2a** is an enlarged view of the personal ordering device of Figure 1;

**Figure 2b** is a circuit diagram of the device of Figure 2A;

10 **Figure 2c** illustrates an alternative personal ordering device;

**Figure 3** illustrates various forms of print media;

**Figure 4** illustrates a typical consumer radio appliance;

**Figure 5** illustrates a typical television set;

**Figure 6a** illustrates a household interface unit;

15 **Figure 6b** illustrates a commercial interface unit;

**Figure 7** illustrates other source media;

**Figure 8** is a pictorial and block diagram illustrating a typical end to end transaction;

**Figure 9** is a circuit diagram of a telecommunications interface;

**Figure 10** is a circuit diagram of a household interface unit;

20 **Figure 11** is a circuit diagram of an interface adapter;

**Figure 12** is a circuit diagram of a scanner;

**Figure 13** is a circuit diagram of a miniaturised personal ordering device;

**Figure 14** is a diagram of an IrDA adapter.

**Figure 15** is a circuit diagram of a DTMF sonic code identification system for a personal ordering device.

**Figure 16** is a high level block diagram of a four tone sonic code detector System for a personal  
5 ordering device.

**Figure 16a** is a circuit diagram of an audio segment amplitude decoding system.

**Figure 17** is a schematic diagram of a back end processing system.

**Figure 18** is a schematic diagram of the main components of a personal ordering device.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

10 Embodiments of the present invention are now described with reference to the Figures where like reference numbers indicate identical or functionally similar elements. Also in the figures, the left most digits of each reference number corresponds to the figure in which the reference number is first used.

**Figure 1** is a pictorial illustration of an end-to-end interactive singular or multiple media ordering system of the present invention.

15 Ideally a Personal Ordering Device, "POD" (101) of the present invention is designed to be coupled with personal security keys such as is required for household, business or motor vehicle entry/exit activation locks. However, for those skilled in the art it should be appreciated that other formats such as credit card sized housings or housing functional with a personal wallet may be utilized to incorporate the functions of POD (101).

20 Referring again to **Figure 1**, POD (101) is communicative and interactive with various source media, including, but not limited to:

- all forms of print media, including books, magazines, newspapers, catalogs, brochures/pamphlets, and labels (102);
- all forms of radio broadcast including short-wave, AM/FM, closed circuit and open  
25 circuit, one way and two way or similar broadcast methods (103);

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- all forms of television including analog and digital and including video drivers such as video machines. DVD and laser disk machines or similar devices that may form part of or are coupled to a television set (104);
- computers or similar devices connected to the Internet (105);
- 5      • kiosks including interactive kiosks and/or automated teller machines (ATMs) (106);
- general public entertainment centres such as movie/video screens, live show audio/video equipment and similar entertainment methods (107);
- advertising billboards (108);
- automatic doors, lifts, security entrances and intercepts and the like (not shown); and
- 10      • information or identification readers such as identification devices, authorization devices, licenses, authorizations and approvals and the like (not shown).

POD (101) is also interactive and communicative with Interactive Interface Units (109) and (110), whereby (109) is a Household Interface Unit ("HIU") and (110) is a Commercial Interface Unit ("CIU"). The HIU (109) includes interactive sensors and circuitry allowing for code and/or data retrieval including serial numbers, time, date and generic samples or signatures of any media promotion  
 15      retrieved as a result of interaction between source media and/or POD (101). HIU (109) is communicative with processing unit or exchange (111) via Public Switched Telephone Network (PSTN) (112) or the world wide web (113) or any similar communications regime such as high speed data lines or wireless if available.

- 20      CIU (110) is typically located at commercial premises or public places and may be connected to processing unit / exchange (111) via for example PSTN (112) or alternatively via world wide web or Internet protocol (113) and may include wireless or high speed data links.

CIU (110) may also be coupled with or form part of point of sale systems such as cash registers (114), parking meter machines, entry/exit payment machines and vending machines.

- 25      CIU (110) may also replace direct point of sale systems (114) as are typically used for processing credit card and cash withdrawal transactions.

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CIU (110) is communicative with and interactive with POD (101) wherein the POD (101) may be that of any authorized user.

Television Remote Controller ("TVR") (115) is a standard un-modified controller which is typically available with the purchase of a television set, DVD or similar appliance sold to consumers. TVR (115) is interactive with HIU (109) which includes infra-red receiving circuitry compatible with standard TVR (115). HIU (109) is further described in more detail at **Figure 6**.

Mobile/Cellular Telephone (116) can be an analog or digital telephone which may include infra-red protocols allowing interaction with other electronic devices and may also include circuitry and control software for access to the world wide web (113). Telephone (116) is interactive with POD (101) whereby POD (101) may download recorded or serialised data to processing unit/exchange (111) via Telephone (116) either by IrDA, or by way of Dual Tone Multiple Frequency (DTMF) generated by POD (101) or alternatively high speed shift key data transfer via a modem circuit.

(117) is an infra-red interface, typically using the IrDA protocol that may be coupled to or form part of the existing circuitry of electronic appliances such as a Personal Computer (105) connected to the world wide web (113) and/or public kiosks/Automated Teller Machines (ATM) (106).

**Figure 2a** is an illustration of a preferred POD (101) whereby (201) is a push, touch or sensor switch which can be activated by the user as a result of cerebral impulse bought about by media promotion or information. (202) is a scanner or code reader port allowing the user to interface with source media and including print media (102) whereby on the user's cerebral reaction to a print promotion the user is able to direct the scanner port (202) at printed code and retrieve said code for immediate or later transfer directly or indirectly to processing unit (111). To transfer said data from the POD (101) for example, the user may aim POD (101) in the general direction of Household Interface Unit (109) or other appliance as heretofore referred and transfer collected code as data via either the Scanner Port (202) or the Head (203) of POD (101) which may incorporate interactive IR or RF circuitry. This transfer is initiated by again operating Switch (201). POD (101) may also include Radio Frequency (RF) circuitry for interaction either directly to processing unit (111) or at short range to HIU (109), or CIUs (110), Telephone (116), or Computer (105). However, for those skilled in the art it will be appreciated that this illustration is by way of example only as there are numerous other appliances may similarly incorporate interactive features to which POD (101) can engage and download data with the objective of transfer to processing unit (111).

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Illustrated Switches (204) and (205) allow for additional features as may be required such as an on/off feature or security input or activation. Additional switches in an alternative version may also allow for checking, editing and deletion of data and for implementing security functions. An edit and review screen (not shown) such as liquid crystal displays may also be included as an addition or option to the custom feature. A printer may also be connected as an additional feature or option.

Typically POD (101) is manufactured to the dimensions suitable for coupling to personal keys. These dimensions could be, by way of example only, length 55mm x width 35mm x overall thickness 15mm. POD (101) may also incorporate circuitry for remote wireless either RF or IR door locking, unlocking features and may also include fingerprint, iris or other forms of electronic circuitry. POD (101) is powered by a battery: typically one or two 6V 4LR44 or one 12VA23 Alkaline battery can be used.

Figure 2b is a visual image of a circuit board (206) in respect to a particular POD (101) unit which includes a scanning module (202) as is typically used to read bar codes. Switch (201) is shown as a micro-switch. Likewise Switch (204) is shown and in this particular configuration is used as a scanner on/off switch for power conservation. Also shown on circuit board (206) are batteries (207), various electronic components including micro-processors (208) and a speaker/microphone unit (209). (210) is an infrared transmitter/receiver. It should be appreciated that circuit board (206) and components thereon are one particular layout design only. For those skilled in the art it will be appreciated that the layout of said circuit board (206) may vary to include other components. It should be understood by those skilled in the art that power management programming is integral with POD (101) whereby circuitry is automatically switched off or powered down when not in use.

Figure 2c is an image of an alternative design for a POD (101) unit wherein circuit board (211) incorporates infrared scanners and transmitters (212) and shows Switches (201) and (204). Circuit (211) also shows micro-processor (213) and battery connections (214). It should be understood by those skilled in the art that POD (101) as can be seen by the visual images of (206) and (211) may include alternative design layouts and hardware devices, including operating software, however POD (101) as part of the present invention may generally include some or all of the following features:

1. non-volatile memory whereby serial or identification numbers are input and retained;
2. a scanning system for up-loading printed codes, including bar-codes;
3. a wireless interface including, but not limited to, infrared or RF in accordance with international standard protocols commonly referred to as IrDA and WAP;

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4. an activation switch which being responsive (directly or indirectly) to cerebral impulses by the user is able to initiate a micro-processor controlled reaction within the circuitry that also includes one or more of a clock/timer, RAM, a buffer for temporary storage and download interface circuitry for transfer of the recorded codes to the processing unit (111) via the appropriate  
5 Interface and communications means either directly or indirectly; and
5. POD (101) may also include security functions such as rolling code or magnetic interface or other systems for activation of live financial transactions as through CIU (110) such as is illustrated in **Figure 1** or other interactive devices as illustrated in **Figure 1**.

In summary therefore POD (101) forms an integral but not critical part of the present invention whereby  
10 it incorporates electronic devices and hardware together with embedded electronic serial or identification numbers, operating programs and memory systems that allow a consumer to interact with source media as illustrated in **Figure 1**. Should the consumer gain a cerebral impulse to respond to media promotions such as advertising, notices or pricing information, gaming opportunities, voting, or shopping for any item, this can be implemented with the simple activation of a switch.

- 15 **Figure 3** illustrates various forms of print media (102) whereby there can be included readable codes such as bar-codes (301) grey scale codes (302) matrix codes (303) or any printed image (304) as may be included in books, magazines, newspapers, catalogs, brochures/pamphlets, labels, restaurant menus, voting papers, gaming tickets etc.

- Figure 4** illustrates a typical consumer radio appliance (103) which includes at least one speaker (401)  
20 from which a device such as POD (101) may receive sound signatures and/or purposely inserted micro-codes within the broadcast signals wherein a POD (101) held within sound distance of radio (103) is able to record, for later transfer, data signatures or micro-codes relating to items promoted by said broadcast sound modulations. It should be understood by those skilled in the art that radio (103) of **Figure 4** may include automobile radios and many other forms of electromagnetic wave transmissions  
25 as used for media broadcasts to the general population. The present invention therefore allows for a consumer in possession of a POD (101) to interact with radio (103) by retrieving item signatures, whether encoded or otherwise from radio broadcast for immediate or later transfer either directly or indirectly by other Interface Units such as (109), (110) (116) and (117) to the processing unit (111). A consumer listening to any broadcast or promotion may engage Switch (201) of POD (101) if there is  
30 initiated, provoked or instigated from said radio broadcast or promotion a cerebral impulse to activate Switch (201).

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**Figure 5** is an illustration of a typical television set (104) whereby the speaker (501) which is integral with normal television sets is able to transfer information by sound modulation typically synchronised with visual images displayed on the screen (502) wherein the medium is being used for purposes which include transfer of information and the promoting or advertising of items. The present invention provides for interaction between the television set, via either sound modulations, pixels, images or light signals from screen (502) and/or wireless including infra-red or radio frequency whereby Household Interface Unit (109) if within (as one example) sound range of Television set (104) may continuously record said sound waves whilst Television (104) is switched on with sound volume operating, wherein the said sound waves (or other forms of data transfer or transmission) provide a signature or code that allows subsequent identification of the associated promoted items. HIU (109) therefore need not be physically connected to Television (104) in one aspect of the present invention.

In an alternative aspect however HIU (109) may be integral with the Television set (104) and may form part of the manufacturing specifications. HIU (109) includes circuitry that allows for the standard TVR (115) to interact with HIU (109) if pointed directly or indirectly at HIU (109) thus enabling HIU (109) to capture and transfer recorded sound or image signatures or codes from an operating Television set (104) to RAM. It should be emphasised that TVR (115) does not need to be modified in any way when used interactively with HIU (109) (in the preferred embodiments of the present invention) which is continually receiving sound and/or image and/or RF and/or infrared signatures relating to items associated with the media content from the Television (502).

**Figure 6a** illustrates a HIU (109) device which typically as part of the present invention is connected via wireless or land line or cable to processing unit (111). HIU (109) may include a microphone (601) indicator lights (602) and (603) a telephone port (604), a printer port (not shown) and an appropriate power supply (605) (not shown). When HIU (109) is installed within sound range either directly or indirectly of a Television (104) as illustrated in **Figure 4** or radio as illustrated in **Figure 3**, HIU (109) may continuously record sound signatures. One aspect of the present invention allows for HIU (109) to be switched on automatically via a volume sensitive switch which may for example be tuned to a specific frequency thereby saving power consumption. HIU (109) will 'wake-up' when volume levels trigger a pre-determined setting. HIU (109) includes a clock that may be synchronised by micro-codes broadcast via Television (104) or Radio (103) thus ensuring that a time and date code can be retrieved when a consumer using a remote control, say (115) or POD (101) triggers the HIU (109) thereby transferring to a memory circuit the exact time and date of the trigger. The present invention includes an operating program in the HIU (109) which also, if required, transfers recorded signatures or samples in

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the form of a code which may comprise either sound modulations recorded in the buffer or micro-codes or image codes. HIU (109) may also intelligently select, through appropriate programming techniques, random dialling options to activate an automatic dialling circuit incorporated therein to dial a pre-programmed number or sequence of numbers for transfer of said codes and other appropriate data to the processing unit (111). HIU (109) may also be coupled via wireless interface (606) directly or indirectly to TVR (115) or POD (101).

In operation therefore it is possible for a consumer who is watching a television program or promotion, to react to said information, for example, to order an item by simply operating a pre-selected key on a standard TVR (115) (this could typically be the mute on/off switch), for no more than (say) one second. If for example the 'mute' button is activated on and then off HIU (109) may be programmed to interpret that signal from remote control unit (115) as a trigger to transfer recorded code from a temporary buffer, after say 10 to 13 seconds and transfer said code to RAM for immediate or later transfer to the processing unit (111) together with the HIU (109) serial number and relevant information or the serial number of an activating POD (101). It should be understood by those skilled in the art that the present invention may also include a wireless Reflector device (607) near the source media i.e. Radio (103) or Television (104). A said Reflector (607) such as a low cost mirror or reflective antennae may transfer the impulse to sensor (604) such a device avoids the cost of installing an additional telephone jack in or near the Television (104) or Radio (103), should one not already exist. Reflector device (607) also avoids stray RF or IR interference whereby a consumer purposely aims a remote unit such as (115) or POD (101) away from the direction of Television (104). It should also be understood that sensor (604) may also be infra-red or IrDA compatible or RF compatible. This allows HIU (109) to be placed in a strategic location near a telephone jack without the cost of installing additional extended telephone coupling jacks thus reducing the cost of installation of HIU (109) at the consumer household. It should also be understood that HIU (109) may be placed within or form part of an existing telephone appliance and that the trigger signal and code retrieving circuitry can form part of a smaller HIU (109) located within sound distance of said source media for example, radio, television or other apparatus.

Alternatively HIU (109) may be directly connected to the audio, television or video output.

As a particular example, a customer watching an advertisement on Television (104) decides to purchase the advertised product. After making the decision, the person activates their POD (101) by depressing a Switch (201). This POD (101) has already stored the audio signature relating to the current advertisement, replacing that relating to the previous advertisement which was not selected by the customer. The Switch (201) activation causes the POD (101) to process the audio signature converting it



to a numerical code which is stored in the POD (101). The audio signature may comprise a sequence of tones, representing a sequence of decimal numbers. After a pre-set time, e.g. 13 seconds, the POD (101) transmits the code together with a customer identification code via an IrDA port using typically RS232 protocol to the HIU (109) where the codes are stored for a further pre-set time. After this delay expires, the HIU (109) automatically dials the pre-selected processing unit (111) and transmits, at high speed, the codes to the processing unit (111). Alternatively, HIU (109) may begin dialling immediately in the event a particular sound or code is sensed from the advertisement or an urgent instruction is input by the consumer. For example, HIU (109) may be programmed to recognise certain sound characteristics such as from the word "pizza". In this instant HIU (109) may dial the pre-set number immediately. In most other cases, however, HIU (109) is programmed to delay dial-out to time slots in accordance with PSTN overload prevention regimes. The dial-out in the preferred embodiment uses selectively programmed numbers to connect with the appropriate or delegated processing unit (111). Transfer of data is typically in the form of, in one aspect, DTMF coded decimal numbers or alternatively via high speed frequency shift key modulation ("FSK"). In the preferred embodiment high speed DTMF transfer is utilized as no "handshake" synchronization is required thus saving up to 28 seconds in dial-up and transmission time. This novel approach also shortens the time needed to transfer codes to + / - 500 milliseconds per item ordered. If the dialling is not successful, it is automatically repeated at random intervals until success is achieved or a connection failure is confirmed to the customer. The processing unit (111) may automatically answer incoming calls, up-load the signals and implement the processing. The HIU (109) and its commercial equivalent CIU (110) include a sensor which is able to determine if the processing unit has answered. This prevents repeated unnecessary dialling whilst at the same time suspending the need for an expensive "hand shake" modem. Indicator lights (603) also signal to the consumer the satisfactory completion of the data transfer. The processing unit (111) internally confirms the suitability and authority of the customer and if this is satisfactory, identifies the product and automatically transmits a request to the supplier of the product to deliver the product to the customer and to bill the customer, providing the merchant with the customer's contact and delivery details. In addition, the processing unit (111) may confirm the order to the customer and adds the transaction information to its processing unit (111) for processing and for billing the merchant for the provision of the service.

In another example, a customer uses their POD (101) to scan bar-codes of selected items printed on a grocery shopping chart supplied by a merchant. When the selection is completed, the customer confirms the selection by depressing Switch (201). The customer then takes their POD (101) to the vicinity of HIU (109) and depresses Switch (201) on the POD (101). The POD (101) downloads the scanned codes and the POD (101) identification code to HIU (109). After a pre-set delay, the HIU (109) automatically

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dials the processing unit (111) and transmits the scanned codes and identification code to the processing unit (111). As above, the processing unit (111) confirms the suitability and authority of the customer and if this is satisfactory, identifies the product and transmits a request to the supplier of the item to deliver the item to the customer and to bill the customer, providing the merchant with the customer's contact and delivery details. In addition, the processing unit (111) confirms the order to the customer and adds the transaction information to its processing unit (111) for processing and for billing the merchant for the provision of the ordering service.

**Figure 6B** is a "CIU" (110) which typically includes the circuitry of HIU (109) with the addition of a Review Screen (609) and Interactive Keypad (610) (covered). CIU (110) is also interactive via IrDA and/or WAP interface with any POD (101) as described herein. CIU (110) is communicative with processing unit (111) via Telephone connection (604). As CIU (110) is likely to be frequently used and may also be required for active financial transactions, CIU (110) is typically connected to processing unit (111) via high speed telephone data line such as Integrated Services Digital Network ("ISDN"). Alternatively, CIU (110) may use packetized data or other suitable wireless interface with processing unit (111). In application CIU (110) is installed at any commercial premises such as grocery stores, book stores, restaurants, movie theatres and any public places including in vehicles, ships and aircraft. Consumers in possession of a POD (101) may download the stored orders and relevant data by directing POD (101) at a CIU (110). The CIU (110) will continuously on-transfer such data to the designated processing unit (111). CIU (110) may also communicate to and with POD (101) units for the purpose of security verification updates and in one aspect instigate and manage rolling security codes via IrDA port (117) or other wireless interfaces. CIU (110) typically includes security lock-out activator circuits compatible with POD (101) protocols whereby CIU (110) may authorise active financial transactions by way of approval for the issue of cash or payment of point of sale items including restaurant meals or entertainment tickets, when activated or triggered by a POD (101) unit. Such interaction avoids the need for credit card or point of sale card transactions. Credit card and other personal details are thereby not transferred down public telephone networks or via Internet connections as the present invention avoids the necessity for transfer of said information.

**Figure 7** is an illustration of other source media including movies (107) and Billboards (108). Any of POD (101), HIU (109) or CIU (110) may interact with such source media.

In the case of (107) when a consumer in possession of POD (101) is viewing a movie, including at a public theatre, if the consumer is interested in any item promoted in said movie, for example a mountain bike, or car used in the movie scenes, the consumer may hold POD (101) up towards the theatre speaker

system and engage Switch (201). This action will "clip" a representative signature of the sound waves associated with said movie sound wave. The said movie sound waves may include additional micro-codes for the movie or segment identification. In its preferred embodiment POD (101) records in numerical form such sound signatures for instantaneous or later transfer to processing unit (111) or later indirect transfer via HIU (109) or CIU (110) units as described in Figure 1. It should be understood that other apparatus such as cash registers, entry/exit devices, or a seat interface may also interact with POD (101). Alternatively, theatre seats incorporating the systems of POD (101), HIU (109) and CIU (110) may also form part of the present invention and allow consumers to interact in like manner.

The sound signatures are typically uploaded via a microphone from speakers at the theatre, including speakers located at or in a seat or remote loud speakers. The said movie may alternatively include means for transmission of RF, light or infrared signatures or signals interactive with POD (101) or similar devices.

A sound signature is typically recorded in a preferred embodiment of the present invention by timing the spaces between pre-determined frequency levels or by the number of tones of various frequencies in a triggered sound sequence. A code is derived therefrom for later transfer directly or indirectly to processing unit (111) for forensic comparison and matching to merchants and promoters. It should be understood that a full sample of sound may also be clipped by POD (101) for transfer and later matching.

It should be understood that movie promotions and programs will indicate to the consumer what if any items are available throughout the movies for ordering. Printed programs for movies and/or like events may include interactive or responsive codes, images or data capable of being clipped or uploaded by a POD (101) unit. This aspect of the present invention provides revenue opportunities for producers of films and/or live events. Movies and/or video may include visible identifiers, say in the bottom corner of the screen, to indicate to patrons that a particular item used in the movie is available.

Billboard (108) typically includes low power wireless RF, visible or infrared emissions continuously repeating signals, typically a 7 digit serial number representative of the sign, detectable by any POD (101) or similar device such as a mobile phone (116) equipped with the appropriate circuitry and including circuitry of POD (101) in another aspect of the present invention. In operation, the present invention therefore allows for consumers in possession of a POD (101) or similar apparatus to interact with billboards, signs or other similar devices either by scanning of printed codes such as bar or matrix codes, or detecting and logging transmitted code signals from said billboard with a simple switch.

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Typically if an IR source is used POD (101) may include image enlargement optics in order to allow a consumer to clip a signature sample from a distance. This is also utilized to scan printed codes from a distance.

It can be seen therefore from Figures 1 to 7 that the present invention has multiple source media capability for capturing sufficient data for end to end promotion, ordering, payment and delivery of items at low cost to consumers and merchants.

A further aspect of the present invention allows for responsive voting, gaming and payments. The present invention through at least its sound signature identification systems securely identifies live presentations that may be attended by a consumer.

Figure 8 is a pictorial and block diagram of a typical end to end transaction utilizing some components of the present invention and represents one aspect of the business system of the present invention whereby a typical consumer (801) is shown holding a POD (101). If the consumer is intellectually stimulated to respond to any promotion from source media, live presentations or when an active financial transaction is required, the consumer may record identifiable samples and/or signatures, printed codes and the like and transfer the same either directly to a processing unit (111) by wireless interface or telephone or via the HIU (109) or CIU (110).

Ideally or preferably these units including the POD (101) remain the property of the Operating Company (802) and are loaned or leased under contract to the Consumer (801). This arrangement allows the operating company to retain control of all identifying codes, operating software and systems as well as the ability to change the same from time to time or to lock out the use of any device associated with the system of the present invention. The lock-out function is operable as part of a credit control regime that may be adopted by the Operating Company (802) through the processing unit (111) from time to time.

The processing unit (111) receives information, preferably in numeric format, and may include binary or character codes. The processing unit (111) separates the incoming numerical data, identifies and matches the identification ("ID") (803) of the originating consumer, a record of the time the consumer triggered the impulse or reaction to the promotion (804) and a product or item code (805) which can be forensically, if necessary, matched to the sound, light or image signatures relevant to any particular product that may or may not be registered with the Operating Company (802). The processing unit (111) will then automatically by email, fax or interactive voice response ("IVR") or other means notify the relevant Merchants (806) of the incoming interest. The Merchants (806) may contact the consumer directly using information supplied by the Operating Company (802) from the processing unit (111).

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This information is authorized for transfer by the Consumer (801) under the terms of issue and use of the interactive devices. It should be understood that activation of the process by consumers may not in itself be a binding order. The present invention allows for direct contact, if necessary, to be made for confirmation of intent. Merchants (806) in some cases may simply contact a delivery company  
5 depending on the nature of the promotion. For example, if the promotion was or is a competition to win a prize or to purchase an airline ticket or other item where there are a limited numbers available, it can be shown that the consumer is fully conscious of the decision to activate the order process and therefore the delivery may be made automatically through a delivery company or system.

Generally a POD (101) would be owned by the processing system Operating Company (802) and  
10 possibly or one or more Merchants (806), and leased to or provided to the Customer (801) free or for a nominal charge. Merchants (806) may also brand and supply PODs (101) to customers. Customers would be encouraged to join the system by way of advertisements, promotions and opportunities to purchase items at discounted prices. When a customer elects to join the system, their personal and financial details, including if necessary preferred credit cards, delivery preferences, expected choices  
15 and options are obtained, checked where appropriate, and stored in the Processing System (111). Other security information may also be agreed with the customer and stored in the Processing System (111). Customers may be provided with a customer identification code which is entered into their POD (101) together with other appropriate security functions and personal data as required. Typically, the identification code and other security information can be entered into the POD (101) through the IrDA  
20 port (117) via a suitable personal computer (105), and stored in the POD (101) in non-volatile RAM. From time to time the customer identification number or other POD (101) security codes may be revised in accordance with a rolling code system for increased security. Rolling codes may be automatically changed each time a POD (101) unit interacts with CIU (110). An audit trail is stored for verification at processing unit (111). Security is also provided by the stored delivery instructions which result in  
25 ordered items being delivered independently to the pre-agreed address stored in the Processing System (111).

A further option available for the benefit of the consumer is an activation security system provided by the present invention which may include a sensor system within the POD (101) HIU (109) or CIU (110) such sensor system, particularly in terms of the POD (101) is interactive with a second active or passive  
30 device held separately on the consumers person, for example in a wallet or attached to a consumer's watch strap. Alternatively there may be provided a second coded device or magnetic strip or source transmitter. In use the consumer may complete an active financial transaction such as the drawing down

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of cash which may require authorization from the processing unit (111), from an ATM. A section of POD (101) is awakened when it is passed close to or interacts with the second coded device. Said second coded device may also include a credit card. That part of the system allowing, both in the POD (101) and the processing unit (111), an active financial transaction, is activated by this process for short periods of time typically three to five minutes, thus preventing or limiting the theft and unlawful use of the device without the matching independent security interface which is dispatched to the user from time to time or modified remotely or randomly.

It should be further understood by the present invention that the images included herein are by way of example only and that the encapsulation of the operating hardware may include any design shape or size appropriate for ease of consumer use or promotional or aesthetic purposes.

It should also be understood that the term "clip" as used to describe the action of obtaining a sample or signature of sonic, visual or printed information at a particular point in time can also include the terms 'download' or 'upload' as the case may be, with the primary intention of ensuring that a cerebral impulse stimulated by information or promotion is properly and efficiently recorded and transferred with minimal further human interaction. Thus the present invention shows that it is possible to minimize the complexities of many human activities including electronic commerce, attendance at public functions, payment for goods and services, and execution of functions requiring security, with a simple yet instantaneous activation initiation process.

Those skilled in the art may also appreciate that POD (101) by nature of inclusion of specially customized electronic circuitry and operating software in terms of the present invention is able to interact with an unlimited number of apparatus including personal computers, entry/exit control systems, ticketing machines or gambling or gaming apparatus. The print or image scanning circuitry also provides a wide range of options to either electronically clip samples or effectively take, in one optional aspect, a photographic or digital representation or image for storage and transfer. The ability of POD (101) to record sonic samples, whilst not limited to segments (this feature is provided for economic efficiency), allows the consumer an even wider interface with multiple forms of media. A further interaction is by way of a PODs (101) wireless interface. The present invention therefore has provided the consumer with at least in its preferred embodiment coverage of a wide range of interactive opportunities. POD (101) also allows consumers to open web sites directly without the need to type or key in addresses. The wireless interface of POD (101) will download ID and other relevant data to an Internet enabled computer (105). An IR link will open said web site and allow direct download of data from POD (101)

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to processing unit (111) without the need to remember and type in Internet addresses. This is also achieved in one aspect of the present invention by the activation of Switch (201) of POD (101).

In a further example of the present invention there is provided an operation system which allows consumers to visit, for example, a shopping mall and with the use of a POD (101) or similar device, upload codes from items or sources for purchase by scanning or code detection and later downloading at an exit interface which may include via a telephone, CIU (110) or on return home via a HIU (109).

In a further aspect of the present invention merchants send by post, email or other delivery, catalogs, brochures, posters, models, images, CDs, DVDs or other promotional media directly to consumers who may use any of the devices or similar devices of the present invention to scan, clip or up-load data for transfer to a processing unit (111) to initiate completion of an end to end order, payment and delivery originating from a singular action by said consumer. It should be understood however that in yet a further aspect of the present invention HIU (109) and TVR (115) are interactive and thereby allow for a sample 'clip' as described herein to be taken and transmitted to the processing unit (111) without the presence of a POD (101) unit. By providing a medium independent ordering system, the invention is able to incorporate multiple different mediums into a single system, thereby ensuring that the benefits of each medium are jointly enjoyed by the users (e.g., customers) and source units (e.g., merchants) of the system.

One embodiment of system of the present invention can enable a user to remotely or locally order and pay for goods and services using a POD (101). In another embodiment of the system a POD (101) can be used for withdrawing, obtaining, transferring or converting funds, loans, mortgages or any other financial instruments. In yet another alternative embodiment, a POD (101) could be used for betting, gambling, tendering, bidding, polling, or participating in surveys. In particular, such an alternative embodiment could be used by a user to interact with an information unit such as a television in order to participate in a television game show or other audience participation program. Another embodiment of the system could be used for booking, confirming details, or obtaining or purchasing items (e.g., plane tickets, theater tickets or restaurant reservations).

Since all of the information associated with these services are managed by the same Processing System (111), a large electronic commerce database can be created, which is able to facilitate value added information services, such as an electronic commerce portal world wide web site, a source of accurate marketing information and the ability to operate a medium independent integrated loyalty program. In particular, because items (e.g., goods and services) are being purchased electronically and passed

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through a processing unit (111), real time marketing information such as user profiles, the time and place of a specific selection (e.g., purchase) and the effectiveness of a specific advertisement can be captured and provided as a value-added service to Merchants (806) of the system. As to a medium independent integrated loyalty program, as a result of the capturing of the selection (e.g., purchase) transactions by users (e.g., consumers), the system can provide additional value-added services to the Merchants (806) to encourage Users to behave in certain manners. The Processing System (111) can incorporate transactions from various independent mediums and communication systems that are coupled to the system to derive, apply or market a body of information.

It should be understood that **Figure 8** is an illustration only of one aspect of the operating system of the present invention. It should be further understood that the Operating Company can include licensee companies such as merchants, credit card companies, banks, government agencies, delivery companies, telecom companies, other utility companies or even private individuals operating in accordance with franchising or licensing arrangements. To ensure that the consumer is properly serviced by the system of the present invention there is also provided various advanced options that allow two way communication between a POD (101) and the processing unit (111) for verification or editing of any transactions.

In the following figures, by way of example only, are circuit diagrams of various hardware components which form part of the present invention. It should be understood however that these circuits represent examples only of operating devices and that variation of the application may be included or utilized for the purpose of completing the process of the present invention.

**Figure 9** is a circuit diagram of a telecommunications interface. This circuit connects the HIU (109) or CIU (110) via a telephone jack (901). Its purpose is to ensure that the electronic equipment used in the invention is compatible with the PSTN and that it meets telecommunications connection requirements and standard connections J3 (901) and J4 (902) connect to the PSTN. This circuit provides for separated outputs and inputs for the PSTN.

**Figure 10** is a circuit diagram of a HIU (109) and CIU (110). This circuit performs a number of functions. It accepts and stores a sequence of code numbers characterising items to be ordered and the identification of the customer via an IR input using IrDA protocols, (alternatively a RF interface is included in lieu of IR). It functions as an auto-dialler to dial a pre-selected phone number corresponding to the processing unit. When the processing unit (111) phone line is opened, this circuit automatically transmits the sequence of code numbers to the processing unit (111) directly in high speed DTMF or via



modem, or shift key FSK modulation or other format. It has a number of status indicators (1001), covering low battery, on line, infra red input detection and dialling failure.

**Figure 11** is the circuit diagram of an IrDA/RS232 interface adapter. This is a two-way circuit interface which converts RS232 data to IrDA protocol and operates an IR LED to transmit IR pulses, and which  
5 can also receive IrDA protocol IR pulses and reconvert these into RS232 data. It enables Inwards/Outwards ("I/O") wireless communication between devices such as a POD (101) and a HIU (109) or between a POD (101) and a computer using infrared as the transmission medium.

**Figure 12** is the circuit diagram of a scanner for multiple density grey scale matrix codes or bar-codes. This circuit detects the refractive density of three grey-scale pixel blocks simultaneously. The blocks are  
10 illuminated by LEDs (1201) and the reflected light is detected by three associated photodiodes (1202). The PIC microprocessor (1203) analyzes the signals detected by the photodiodes (1202) and converts the signals into a numerical code which can be buffered, processed and stored. A sequence of numerical codes can be added to the memory which also contains a device identification code number. The sequence of processes and stored code numbers, together with the device code number can be down-  
15 loaded via an IrDA port through the IR LED D4 (1204).

**Figure 13** is the circuit diagram of a miniaturised POD (101). This circuit performs a number of functions enabling ordering from printed and audio source media. It contains a bar-code scanner (1301) that reads and decodes type 39 bar-codes, and stores the associated item codes as a sequence. The device also stores pre-entered customer identification codes. It can output item code number sequences and  
20 user identification codes by means of a (wireless) IrDA port (1302) and also by means of a DTMF sonic wireless port (1303). The circuit functions as an auto-dialler to dial one or more pre-selected phone numbers corresponding to the processing unit (111), and to download data by means of DTMF tones through a telephone handset (116) via I/O or IrDA format through a HIU (109). The IR interface receives programming codes for alternation of pre-set codes or collection of orders. The unit may also  
25 receive variable rolling user codes.

**Figure 14** is an IrDA adapter. This circuit allows a device such as the POD (101) to communicate with other devices including computers by means of two-way infrared transmissions. The operating software associated with **Figure 14** allows consumers to open directly to a pre-set Internet site and to transmit automatically from POD (101) to a processing unit (111) and to download and up-load orders without  
30 the need to navigate typical Internet scroll and type instructions.

**Figure 15** is a circuit diagram of a DTMF Sonic Code Identification System for a POD (101). Sound from a source such as a television or radio speaker (1501) is detected by the microphone (1502) and amplified by a low noise bandpass amplifier (1503) with selectable gain for optimization of output. The amplified signal is then passed into an MT8870 DTMF decoder chip (1504). This integrated circuit provides approximately 100 dB of Automatic Gain Control ("AGC") with additional band filtering. The signal passes through a series of switched capacitor multipole filters (not shown) which detect and decode the DTMF tones to produce a serial 4 bit binary output (1-16) for each successive tone pair detected. The minimum tone width for detection is about 25 ms, and the minimum gap between tones is of the order of 20 ms. Thus a 5 digit, base 16, DTMF tone code can be as short as 205 ms.

**Figure 16** is a block diagram of a Four Tone Sonic Code Detector System for a POD (101). Sound from a source such as a television or radio speaker (not shown) is detected by a Microphone (1602) and amplified by a bandpass amplifier (1603). The signal is passed through an AGC (1604) and fed into four separate narrow band tone filters (1605) (e.g. LM567) set at center frequencies f1 to f4, each of which produces a HIGH during the presence of the appropriate tone. The output of these filters are fed to a 4 input AND (1606). The presence of four simultaneous tones in bands f1 to f4 triggers a timer (1607) (e.g. LM555) which outputs a HIGH of the order of (for example) 5 seconds and also resets the four counters (1608). During the period of the timer HIGH, the four 2-input AND gates (1609) pass HIGH pulses to the four counters (1608) respectively such that each counter counts the number of times a tone event of the appropriate frequency band occurs during the timer HIGH period. The output of the four counters (1608) is fed into a parallel-to-serial buffer (1610) which produces and holds a serial output representing the number of tone occurrences detected during the timing interval in each of the four frequency bands, f1 to f4. This serial number is used to characterize the signature or "tune" representing a particular item coded in this manner through the sound source.

**Figure 16a** is a circuit diagram of an audio segment amplitude decoding system. This circuit is used to count the number of amplitude excursions above a threshold determined from the mean amplitude of the sound signature over a pre-determined time period following a trigger event to associated a number with the sound signature of an audio track which contains a trigger event such as a silent period, multiple tone or extreme amplitude excursion. By this means, a sound track can be converted to a machine readable code with minimal or no interference with the original content of the sound track. In this circuit sound from a microphone (1611) is amplified, passed through an AGC (1612) and after buffering is split into two signals. One signal is rectified and integrated through a 0.5 second integrator to provide a moving amplitude threshold which is used to set the level of a comparator (1613), while the other signal

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is fed to the other input of the comparator (1613), which therefore produces an output each time an amplitude excursion exceeds the moving threshold. Provided the threshold signal is above a preset value determined by comparator (1614). HIGHs are sent by (1613) and (1614) to the NAND (1615). NAND (1615) also receives a (double) fixed period timing HIGH when the 2 LM567 tone decoder (1616) detect  
5 2 simultaneous tones of predetermined frequency from the microphone (1611). The timing period is determined by the monostable (1617). During this period, when (1616) has 4 HIGHs at its inputs, the number of amplitude excursions exceeding threshold are counted by the counters (1618) and stored in buffers (1619) for outputting as a number code characterising the sound segment. These numbers remain in the buffers (1619) until a subsequent input tone pair re-triggers the timing circuit, which then also  
10 clears the counters (1618).

It should be understood that substantially the whole or any part of the foregoing circuits can utilize combinations of generic and application specific integrated circuitry ("ASIC") in order to reduce size and volume costs.

**Figure 17** is a Schematic Diagram of a back-end processing unit for the present invention In this  
15 diagram, data from the user, typically number codes identifying a consumer and their list of orders, is accepted either from the PSTN (1701) by way of DTMF tones, from a wide band ISDN telecommunications network (1702) by way of high speed FSK modulation, from a communications network Internet Protocol input (1703) (typically using PSTN or ISDN lines), or by means of wireless application protocol (1704). The data is accepted into a scaleable auto-answering 2-way queuing buffer  
20 (1705) capable of handling a scaleable number of simultaneous calls. It has been calculated that a city of 200,000 could be efficiently served by a unit with approximately 20 equivalent incoming lines. The system also allows a consumer to be connected to an interactive voice response ("IVR") system (1706) for selecting a manual response (1707). Data from automatic calls is stored in the buffer (1705) for processing by the processor unit (1708). This processor (1708) converts codes in items and their  
25 suppliers and creates instructions to merchants detailing items, customer details, preferences and payments systems, and instructs the merchants where and how to supply the said items. It creates customer records and confirmation statements. The processor (1708) also carries out data analysis, financial processing and recording which is stored in the electronic data store (1709). Output for merchants, customers, records and system operation is fed to an electronic mail buffer (1710) from  
30 where it can be transmitted by electronic means through the automatic electronic transfer system (1711) into the queuing buffer (1705) where it is sent to the merchant electronically as e-mail or facsimile.

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Generally, a printed record is also output through the printer (1712), and a copy of this may be sent to customers and merchants who do not have electronic mail systems.

**Figure 18** is a schematic diagram of the main components of a POD. In this diagram, there are 3 input/output devices, a print code scanner (1801), a combined speaker/microphone (1802) and a wireless input/output (1803) which may be either IrDA or RF. The scanner (1801) is by nature an input device only, but can be used for control and editing by taking instructions from read codes, and can delete previously read codes by re-reading them in conjunction with a "delete" code. The control switches (1804) are one or more switches used to signal "item order" instructions, security arming, data download, and programming input. These peripherals all interact with the processor (1805) which implements the functions of the POD. Other peripherals for the processor (1805) are non-volatile memory (1806) which stores programs and permanent data such as customer personal identification codes, RAM (1807) which stores input and processed data including item signature inputs and associated processed item codes for outputting, a DTMF and "beep" tone generator (1808) for automatic dialling, one or more status indicators (1809) and a time and date clock (1810). The POD also includes a battery (1811) for providing operating power and a power management system (1812) to minimize overall power consumption.

It should be understood that a non-volatile memory may simply include a serial number for the POD (101). No personal identification details need to be recorded and held in memory. The POD (101) serial number is matched with stored personal data at processing unit (111).

In addition to any of the foregoing of the present specifications, by means or capable of is not simply meant the physical means but is also meant the software means in which the function of the means is realized by the software. Further, the function of one means or capability may be realized by two or more physical means or the function of two or more means may be realized by one physical means.

## CLAIMS:

1. An ordering system including a device interactive with one or more forms of information sources including singular or multiple media and which is responsive to human cerebral impulses.
2. An ordering system as claimed in claim 1 whereby a cerebral impulse is empowered to activate a chain reaction within said device and between said information and a processing unit.
3. An ordering system including said interactive device of claim 1 which includes at least one... operating switch, interactive sensors, memory circuits and data processors activated via cerebral impulses responsive to at least one form of media promotion or information source whereby said device is communicative to and with a data processing regime and is capable of transferring identification data relevant to both the said media promotion and the instigator of said cerebral impulse.
4. An electronic transaction system which comprises means for identifying one or more products, services or information quanta and means for rapidly recording a response to said identification of products, services or information quanta by means of a simple action so as to associate particulars of the respondent with the identified products, services or information quanta as a basis for a present or future transaction.
5. A system as claimed in claim 4 wherein said means for recording a response consists of a single switch closure or key-stroke.
6. A system as claimed in claim 4 or claim 5 wherein said identification of products, services or information packets is a machine-readable signature, code or sequence.
7. A system as claimed in claim 6, wherein means is provided for providing, displaying, disseminating or broadcasting said signature, code or sequence simultaneously with information relating to the product, service or information quanta and wherein telecommunication means is utilized to transmit a customer's response to the said provision, display, dissemination or broadcast together with particulars identifying the customer for processing remote from the customer.
8. A system as claimed in claim 7, wherein some particulars of the customer are stored in a control unit associated with the said customer, the control unit being adapted to transmit said particulars

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together with identification of a signature, code or sequence to a processing unit via a telephone connection or other communication means.

9. A system as claimed in claim 8, wherein the control unit is adapted to store a signal associating the signature, code or sequence with the customer's particulars in response to a keystroke or closure of a switch for later transmission to a processing unit.

10. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is a radio or television broadcast and the signature, code or sequence is sonic.

11. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is a radio or television broadcast and the signature, code or sequence is electromagnetic radiation.

12. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is printed or pictorial media and the signature, code or sequence is a printed character code or matrix transferable by means of electromagnetic radiation.

13. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is a physical display and the signature, code or sequence is electromagnetic radiation.

14. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is a physical display and the signature, code or sequence is a printed code or matrix transferable by means of electromagnetic radiation.

15. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is a physical display and the signature, code or sequence is sonic.

16. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is a visual display and the signature, code or sequence is a printed code or matrix transferable by means of electromagnetic radiation.

17. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is a visual display and the signature, code or sequence is electromagnetic radiation.

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18. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is an audio visual display and the signature, code or sequence is electromagnetic radiation.
- 5 19. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is an audio visual display and the signature, code or sequence is sonic.
20. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is print, pictorial, visual or physical and the signature, code or sequence is magnetic.
21. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is print, pictorial, visual or physical and the signature, code or sequence is electric.
- 10 22. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is print, pictorial, visual or physical and the signature, code or sequence is infrared.
23. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is print, pictorial, visual or physical and the signature, code or sequence is sonic.
- 15 24. A system as claimed in any one of claims 7-9 wherein the provision, display, dissemination or broadcast is television, video, radio, print, pictorial, visual or physical and the signature, code or sequence is RF.
25. A system as claimed in claim 11 as appendant to claim 8 or claim 9, wherein the control unit is a hand held infrared remote control for a television, radio or audio visual set.
- 20 26. A method of commercial transactions which comprises associating a machine-readable signature or code with an offered or advertised product, service or information packet, providing particulars of a customer in a device capable of reading said signature or code and responding to the signature or code in a way which associates said customer with said product, service or information packet so as to offer or effect a transaction.
- 25 27. A method of commercial transactions which comprises associating a machine-readable signature or code with an offered or advertised product, service or information packet, providing particulars of a customer in a device capable of reading said signature or code and responding to the signature or code in a way which associates said customer with said product, service or

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information packet so as to effect or offer a transaction wherein part of the device is a telephone hand set.

28. A method of commercial transactions which comprises associating a machine-readable signature or code with an offered or advertised product, service or information packet, providing particulars of a customer in a device capable of reading said signature or code and responding to the signature or code in a way which associates said customer with said product, service or information packet so as to offer or effect a transaction wherein part of the communication means is wireless.
29. A method as claimed in claim 26 wherein said response is by telecommunication means to a processing unit at a location remote from the customer.
30. A method of electronic commerce wherein transaction data is used to characterize and subsequently predict customer behaviour.
31. A method of electronic commerce wherein transaction data is used to analyze and assist with production planning.
32. A method of electronic commerce wherein one or more merchants accept orders from customers via an electronic processing unit system.
33. A method of electronic commerce wherein credit is provided to customers by a plurality of merchants via an electronic processing unit system.
34. An multiple application electronic transaction system which includes means for storing information relating to a specific customer and allows that information to be used for a multiplicity of purposes including ordering items, enabling security functions and confirming approvals, authorizations and transactions for the said customer.
35. An multiple application electronic transaction system which includes means for storing information relating to a specific customer and allows that information to be used after customer-specific activation of the device for a multiplicity of purposes including ordering items, enabling security functions and confirming approvals, authorizations and transaction for the said customer.



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36. A method of enhancing the effectiveness of billboards, advertisements, displays or promotions by associating them with a signature or transmission which can be automatically detected by a simple device and used to order the subject item.
37. A method as in 36 where the signature is sonic.
- 5 38. A method as in 36 where the signature is infrared reflection or transmission.
39. A method as in 36 where the signature is in the form of a printed code or signal.
40. A method as in 36 where the signature is electromagnetic radiation.
41. A method of providing advertisements, displays and information whereby the said advertisement, display or information includes a machine readable signature or transmission for enabling  
10 identification of items disclosed therein.
42. A method of providing advertisements, displays and information whereby the said advertisement, display or information provides a machine readable signature or transmission for enabling identification of items disclosed therein.
43. A method as in claims 41 and 42 wherein the signature is displayed by way of print or pictorial  
15 media.
44. A method as in claims 41 and 42 wherein the signature is sonic.
45. A method as in claims 41 and 42 wherein the signature is an electromagnetic wave.
46. A method of broadcasting television, radio or other media wherein said broadcast includes information which includes a machine readable signature for enabling identification of items  
20 disclosed therein.
47. A remote ordering device comprising one or more interactive switches the operation of which instigates a sequence of processes resulting in a response being generated.
48. A remote ordering device having at least one switch, said switch being capable of being actuated in response to impulse reactions initiated by promotions.

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49. A remote ordering device activated by one or more switches directly or indirectly, such interaction initiating a response by a promoter or advertiser to said activation
50. A selection transceiver comprising at least one switch which when activated in response to a promotion, written, broadcast, information item or otherwise, retains and immediately or  
5 subsequently transmits data relevant to said promotion, advertisement or information item, whereby such transmission when retrieved enables a direct or indirect response.
51. A device which on receipt of a trigger signal or switch activation executes a process which includes stringing together selected item codes, augmenting said item codes with one or more codes identifying a User and transmitting said string to a device for processing.
- 10 52. A device which on receipt of a trigger signal or switch activation executes a process which permits editing of selected items codes, stringing together selected item codes, augmenting said item codes with one or more codes identifying a User and transmitting said string to a device for processing.
- 15 53. A device which on receipt of a trigger signal or switch activation executes a process which permits editing of selected items codes, stringing together selected item codes, augmenting said item codes with one or more codes identifying a User and transmitting said string to a device for processing with a selectable or variable delay between the actuation signal and the transmission of the said string.
- 20 54. A device which on receipt of a trigger signal or switch activation executes a process which includes stringing together selected item codes, augmenting said item codes with one or more codes identifying a User and transmitting said string to a device for ordering the said items for the said User.
- 25 55. A method of providing identification of items ordered in relation to promotions, advertisements or information on broadcast or transmitted media by recording the time and date of the order wherein the scheduling of said broadcasts or transmissions is used to identify the items.
56. A method of coding or decoding information provided with promotions, advertisements and information by analyzing part of the sound track associated with the promotion, advertisement or information.

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57. A method of coding or decoding information provided with promotions, advertisements or information by detecting and analyzing the pattern or sequence of light emitted by one or more pixels in the images displayed.
58. A method of coding or decoding information provided with promotions, advertisements or information by reflecting a coded infrared or RF signal within the space where the advertisement is visible.
59. A method of coding or decoding information provided with promotions, advertisements or information by processing the associated intermediate frequency, video, carrier or other signals within the circuitry used for a TV set, video player, CD-ROM player, video disk player or other video processing system.
60. A method of detecting sound codes used to identify items which on receipt of a trigger signal or switch activation holds one or more of these codes in a device for processing.
61. A method of coding or decoding information provided with advertisements by sound dubbing which allows an associated item to be identified by the detection of a sequence of sound tones.
62. A method of coding or decoding information provided with advertisements by sound dubbing which allows an associated item to be identified by the detection of a sequence of sound amplitude levels.
63. A method of detecting video, light, infrared, radio frequency, intermediate frequency or other forms of codes or signals used to identify items which on receipt of a trigger signal or switch activation holds data equivalent to one or more of these codes in a device for processing.
64. A method of selecting video, light, infrared, radio frequency, intermediate frequency or other forms of codes or signals used to identify items whereby a trigger signal or switch activation holds data equivalent to one or more of these codes in a device for processing.
65. A method of detecting characters, bar-codes, matrix-codes, symbol codes, pattern codes or any printed codes used to identify items which on receipt of a trigger signal or switch activation holds data equivalent to one or more of these codes in a device for processing in a remote ordering system.

66. A method of detecting characters, bar-codes, matrix-codes, symbol codes, pattern codes or any printed codes used to identify items which on receipt of a trigger signal or switch activation transmits data equivalent to one or more of these codes in a device for processing in a remote ordering system.
- 5 67. A method of ordering one or more items which detects a code pertaining to each said item, augments the said codes with one or more further codes identifying the User, and transmits the combination of codes to a processing system which deals with a multiplicity of such Users.
68. A method of ordering items wherein the request to order is signalled by a User-operated switch in response to a promotion, advertisement or information, whereby the said request is automatically  
10 conveyed to a processing center which arranges for the supply of said items to the User.
69. A remote ordering device which also functions as a credit card, debit card, personal identifier or authorization device.
70. A remote ordering device which also functions as a credit card, debit card, personal identifier or authorization device which may be used to authenticate a user's identity, credit or other personal  
15 data.
71. A remote ordering device which allows the authorized user to implement one or more banking functions.
72. A remote ordering device which allows the authorized user to make payments or charge items at any suitable interface device capable of connection to an associated processing system.
- 20 73. A scanner for printed codes which also functions as an ordering device.
74. A scanner for printed codes which stores one or more said scanned codes which also incorporates an auto-dialler or transmitter which can automatically transmits the stored codes to a second device by electrical or electronic communication means.
- 25 75. A scanner for printed codes which stores one or more said scanned codes, which also stores one or more personal codes pertaining to a User, and which can form the said codes as a string and transmit said string to a second device by communications means.

76. A code reader wherein one or more stored previously scanned codes can be edited or deleted by re-scanning the code in association with the activation of a switch on the reading or storage device.
- 5 77. A code reader wherein one or more stored previously scanned codes can be edited or deleted by re-scanning in conjunction with the scanning of an "instruction" code which causes re-scanned item codes to be deleted.
78. A device for detecting and storing data equivalent to one or more audio codes which also functions as an ordering device.
- 10 79. A device for detecting and enabling the selection and storing of one or more audio codes or data equivalent to the said codes.
80. A device for detecting and enabling the selection and storing of data equivalent to one or more audio codes which also incorporates an auto-dialler which can automatically transmit the stored data to a second device by communication means.
- 15 81. An ordering and processing system including a personal response ordering device, communication links activated by said personal device between the operator of the device and source units or promoters of goods services, interactive processes, and confirmation or verification or delivery systems responsive to one or more switched operations of said personal device.
82. A remote control ordering device incorporating one or more interactive switches, the operation of which instigates a sequence of processes resulting in a response being generated.
- 20 83. A remote ordering device having at least one switch actuated in response to a reaction initiated by promotions, advertisements or information.
84. An ordering device activated by one or more switches directly or indirectly, such interaction initiating a response by a promoter, advertiser, seller, marketer or agent of same to said activation.
- 25 85. An ordering system which has provision for automatic logging in or diversion of a computer window to the User's data at a ordering system Internet site.
86. An ordering system incorporating a code identifying the User to the processing system and which is stored in the said User's ordering device.

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87. An ordering system incorporating a code identifying a User to the processing system and which is stored in the said User's ordering device, which can be automatically altered or exchanged from time to time by means of interaction with the system processing center.
- 5 88. A personal ordering device having at least one switch which when activated in response to a promotion, advertisement or information item retains and transmits data relevant to said promotion, advertisement or information item, whereby such transmission when retrieved may result in a direct or indirect response by a second party.
- 10 89. An ordering system that enables a User to place bets, participate in gaming activities, enter competitions, or participate in games of skill or chance by the use of a scanning device or in response to coded advertisements, announcements or information.
90. An ordering system that enables a User to participate in surveys, polls, voting or other processes by the use of a scanning device or in response to coded advertisements, announcements or information.
- 15 91. An ordering system that enables a User to participate in auctions, tenders, selling, buying or other processes by the use of a scanning device or in response to coded advertisements, announcements or information.
92. A method of providing advertisements, promotions, displays or information wherein a customer can execute an order or purchase by operating a switch.
- 20 93. A method for improving advertisements, promotions, displays or information by incorporating readable signature or transmissions which assists automatic implementation of the said advertisements, promotions, displays or information.
94. An ordering system enabling rapid evaluation of the efficacy of advertisements, promotions, displays or information.
- 25 95. A miniaturized self-contained portable ordering device useable with a multiplicity of promotion and information media.
96. A business system wherein customers are provided with a portable personal ordering device useable with a multiplicity of promotion and information media and through which orders are

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transmitted by electronic means to merchants and suppliers for subsequent delivery to said customers.

97. A business system as claimed in claim 96 wherein customer preferences, delivery requirements and financial details are stored and processed remote from the customer.
- 5 98. A business system as claimed in claim 96 wherein payment is made through the business system to said merchants and suppliers.
99. A business system as claimed in claim 96 wherein said merchants and suppliers bill customers directly or indirectly.
100. A business system as claimed in claim 96 wherein security is provided by the interaction of a  
10 second passive or active device to activate the personal ordering device.
101. One or more systems for implementing the above claims 1 - 100 wherein the method of implementation can be in hardware, software or any combination of these technologies.

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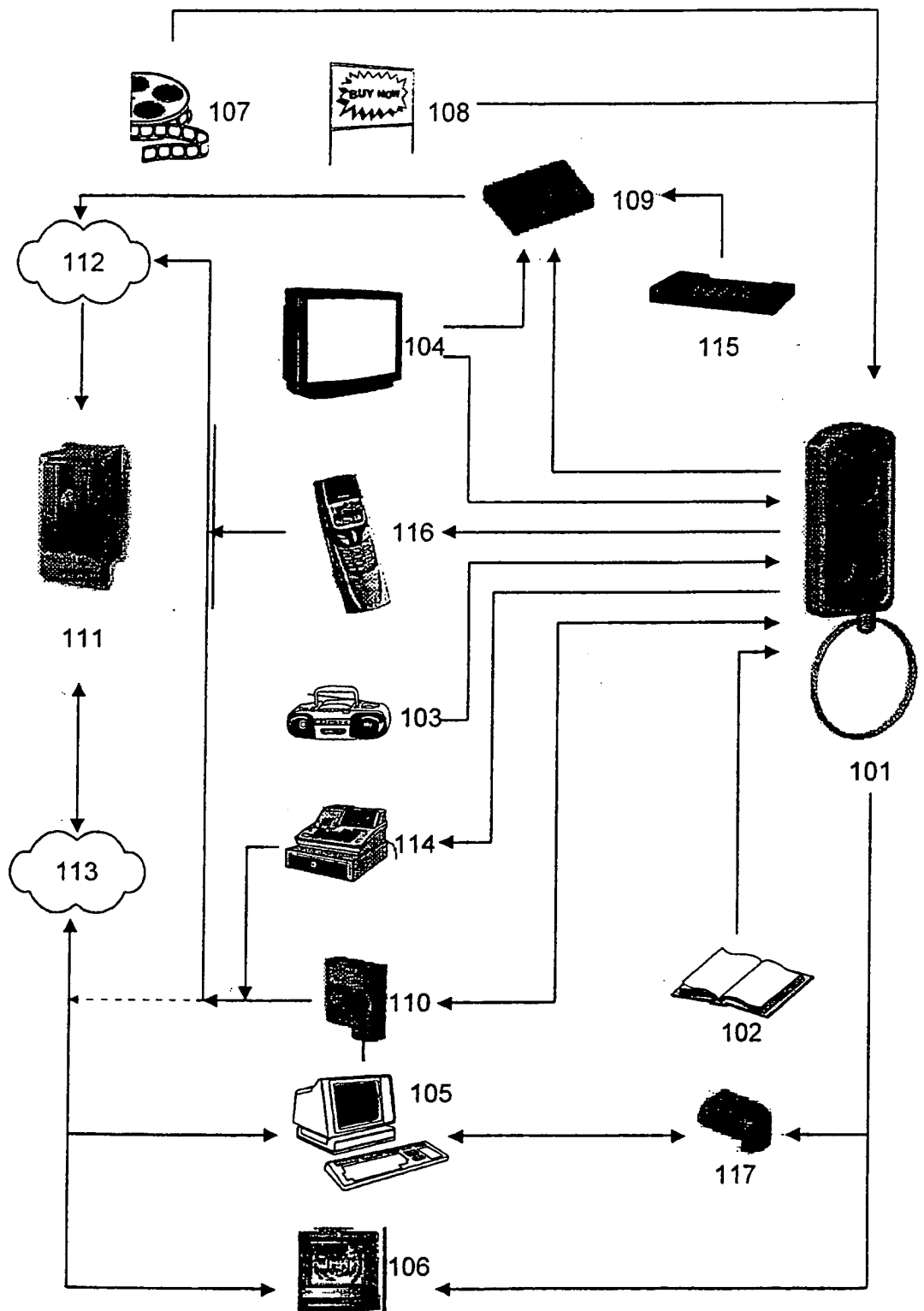


Figure 1



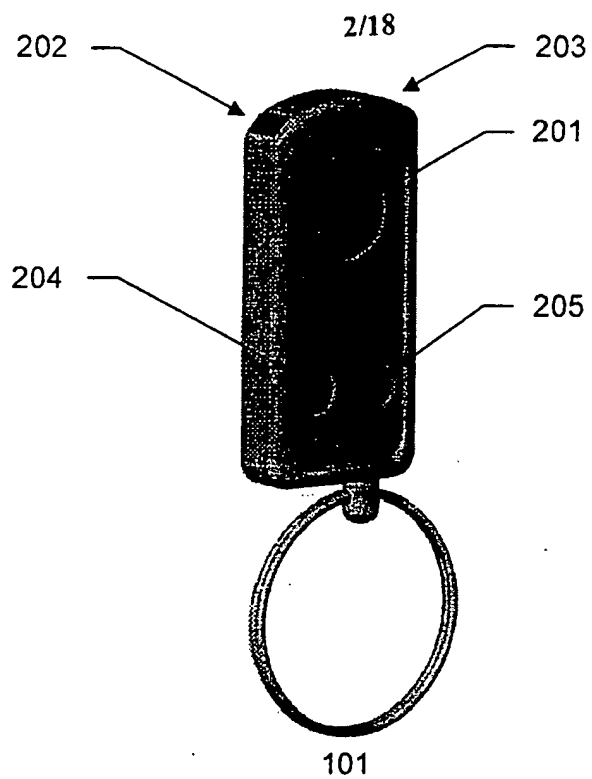


Figure 2a

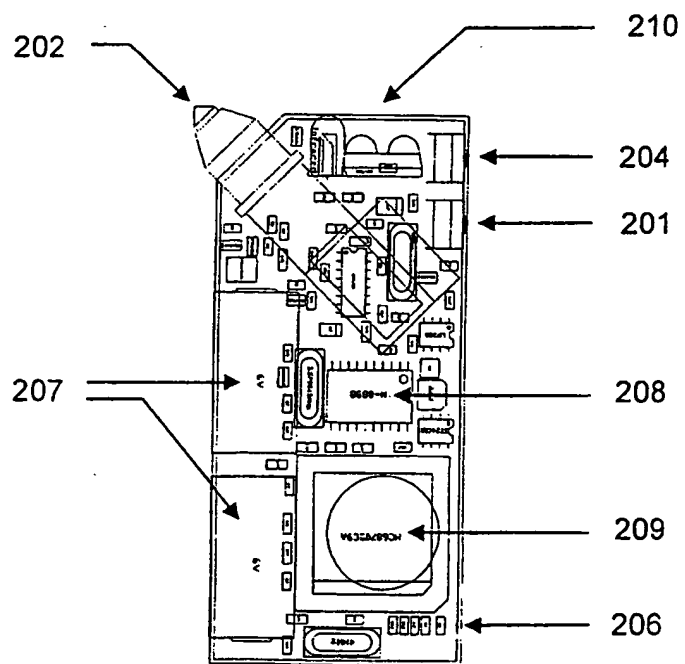


Figure 2b

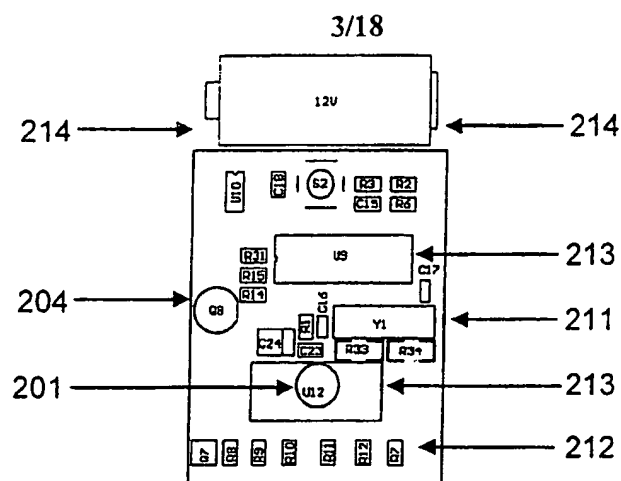
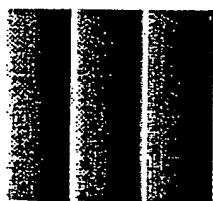
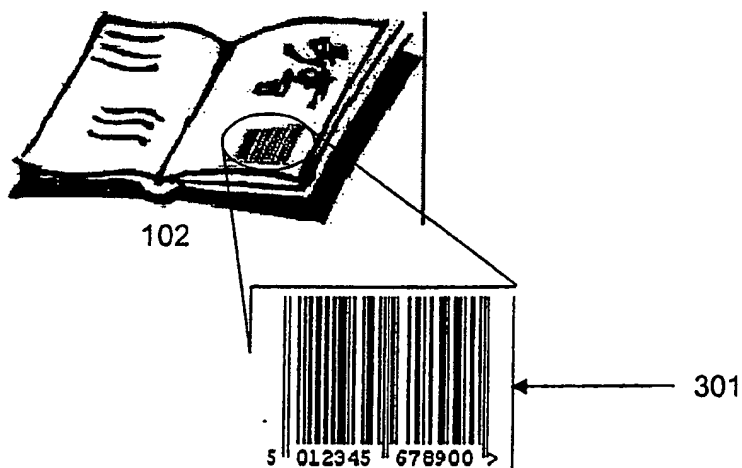
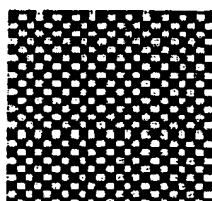


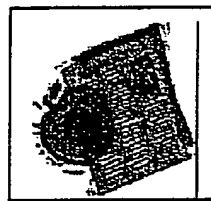
Figure 2c



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303



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Figure 3

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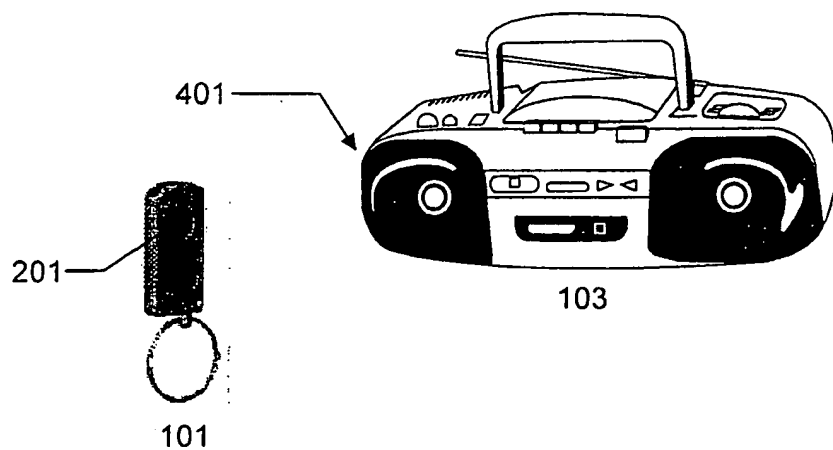


Figure 4

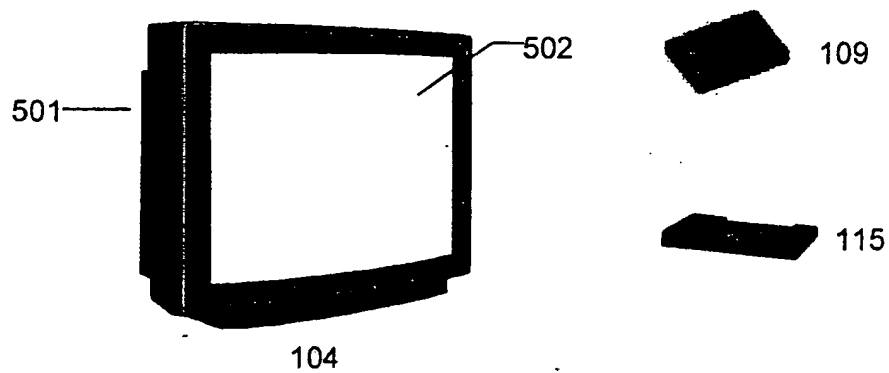
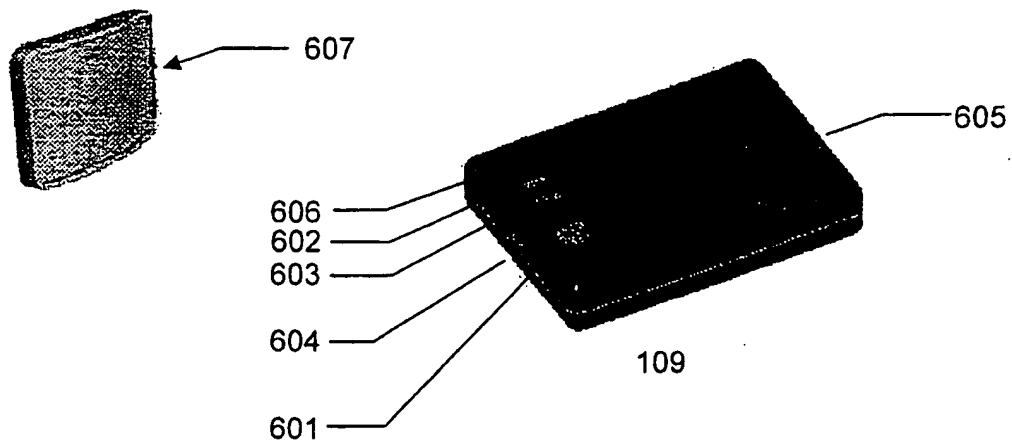
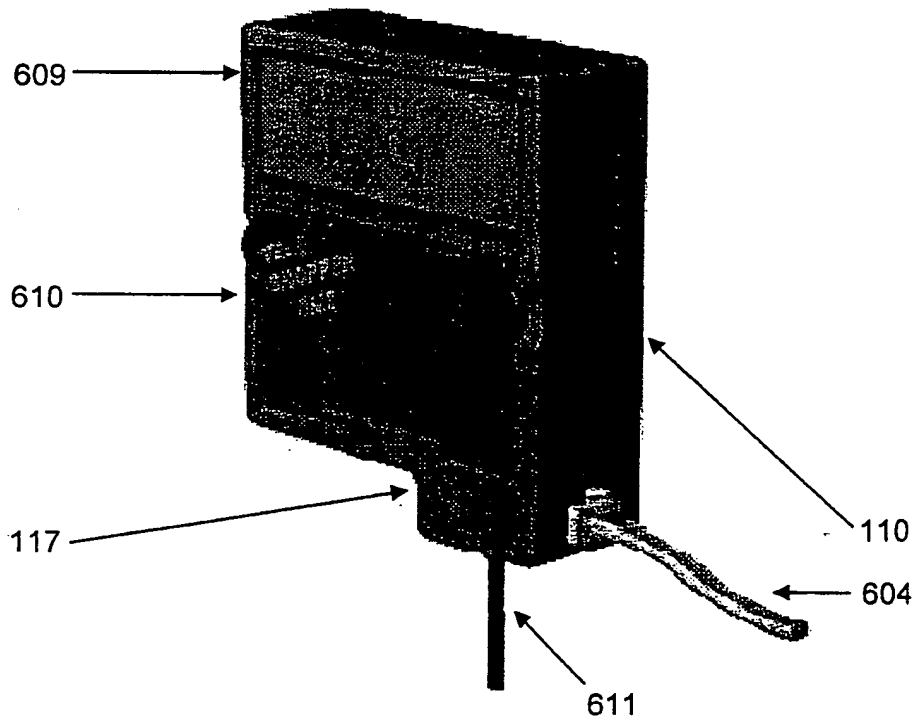


Figure 5

**Figure 6a****Figure 6b**

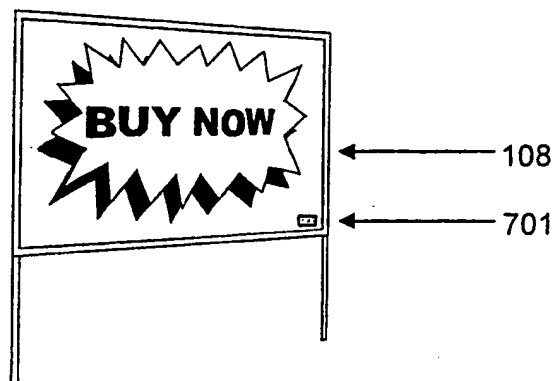
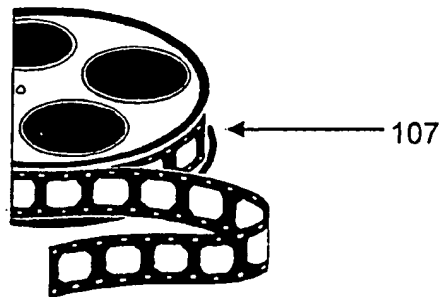
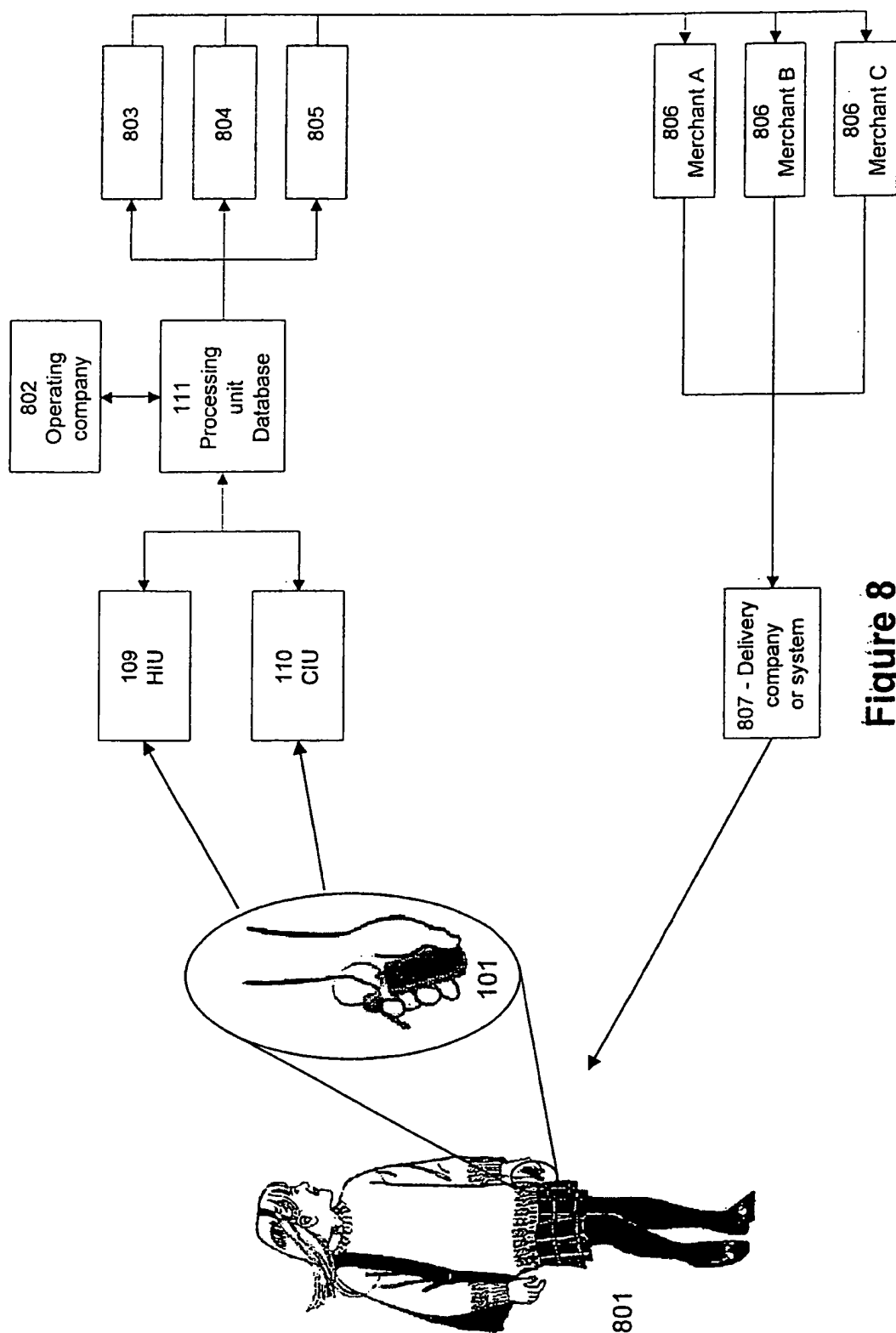


Figure 7



**Figure 8**

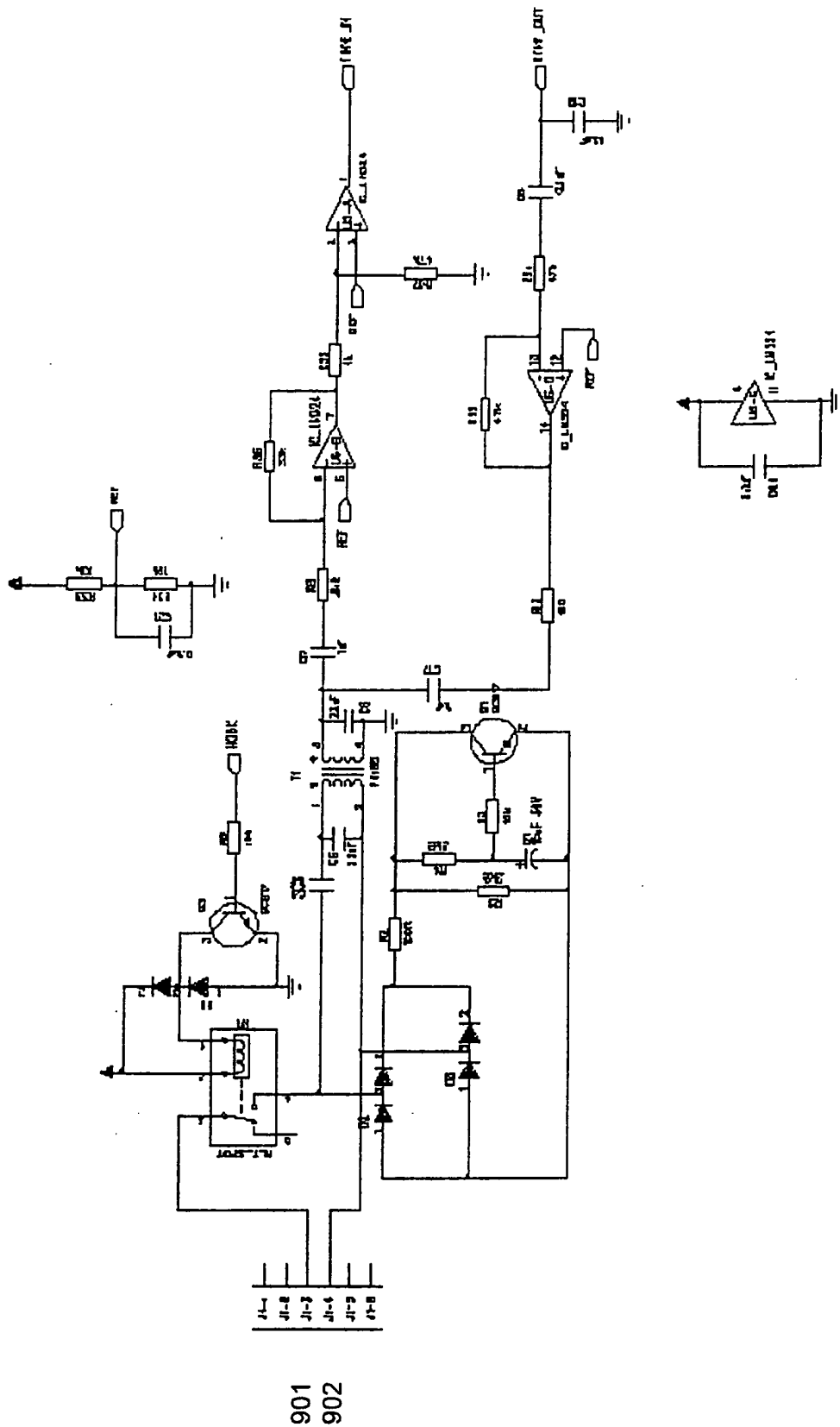
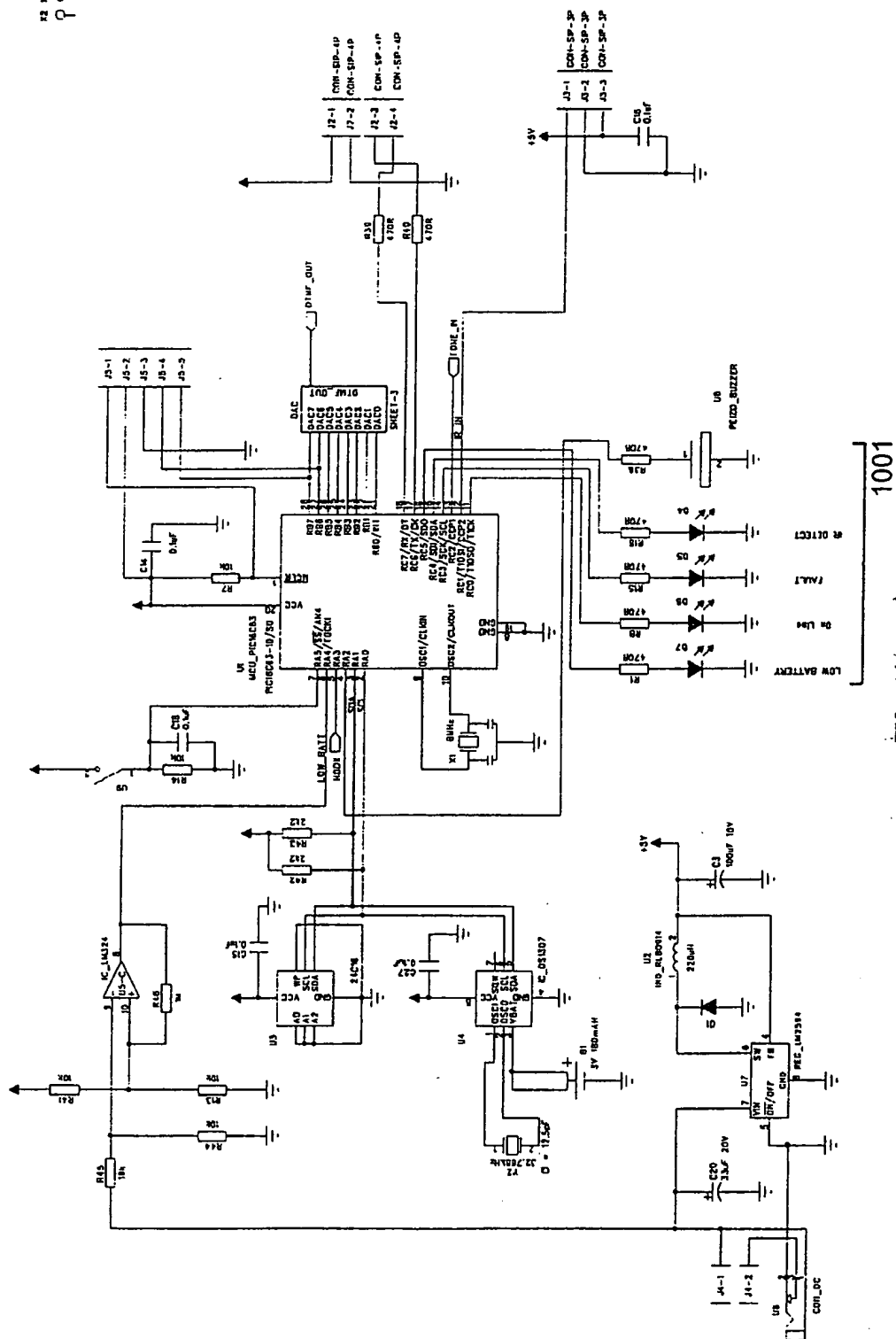
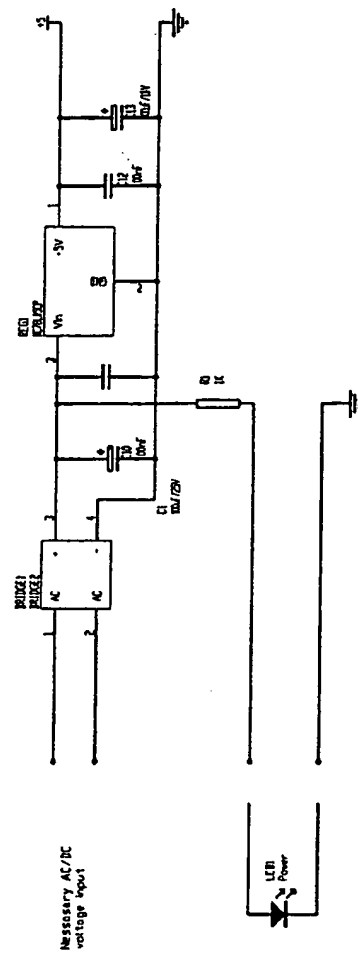
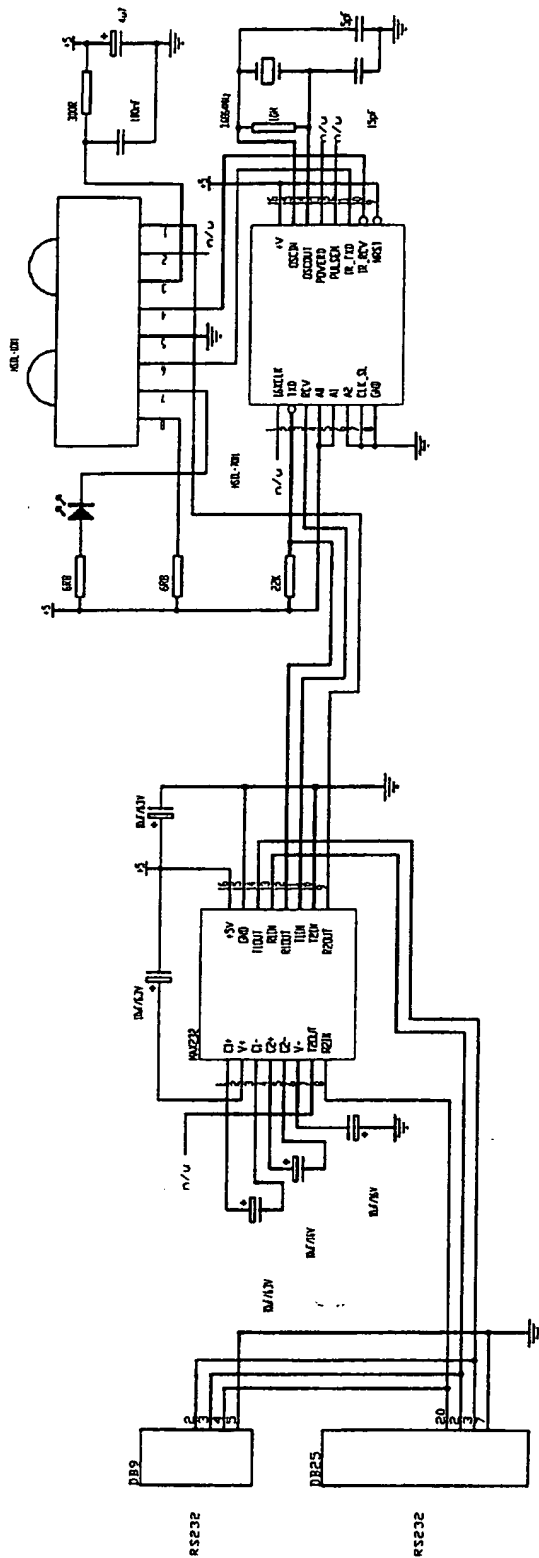


Figure 9



## Figure 10





## Figure 11

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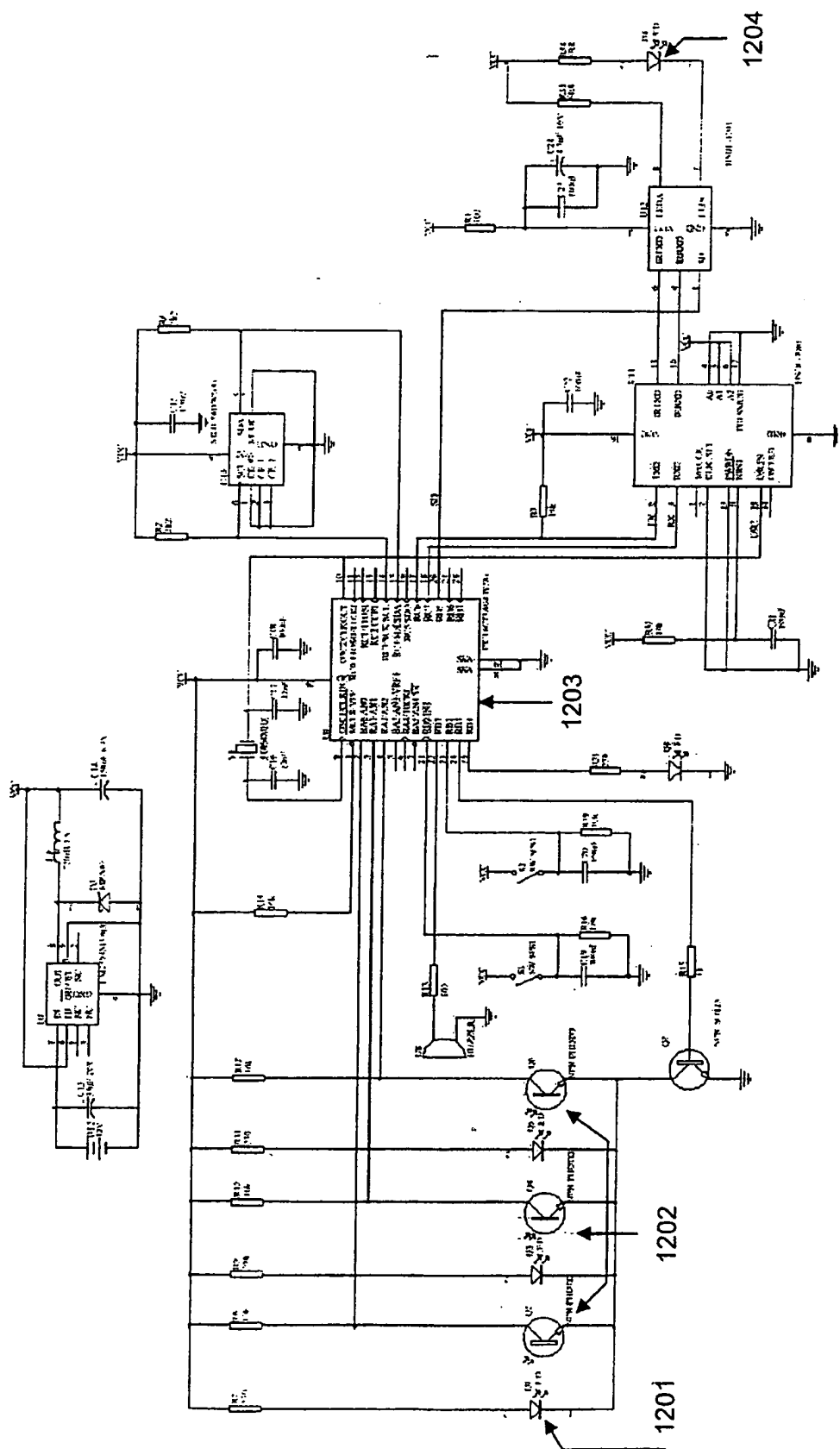


Figure 12

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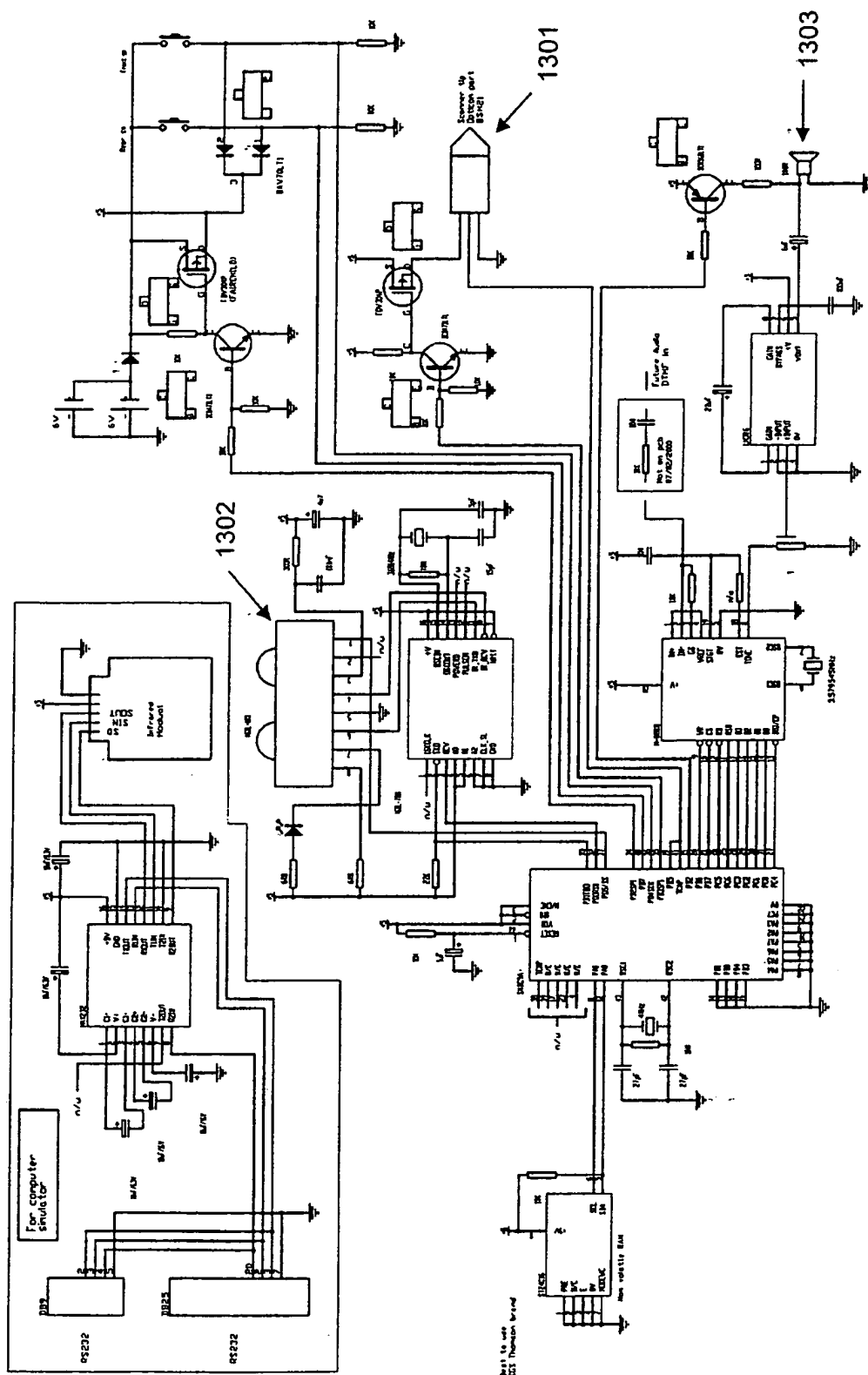
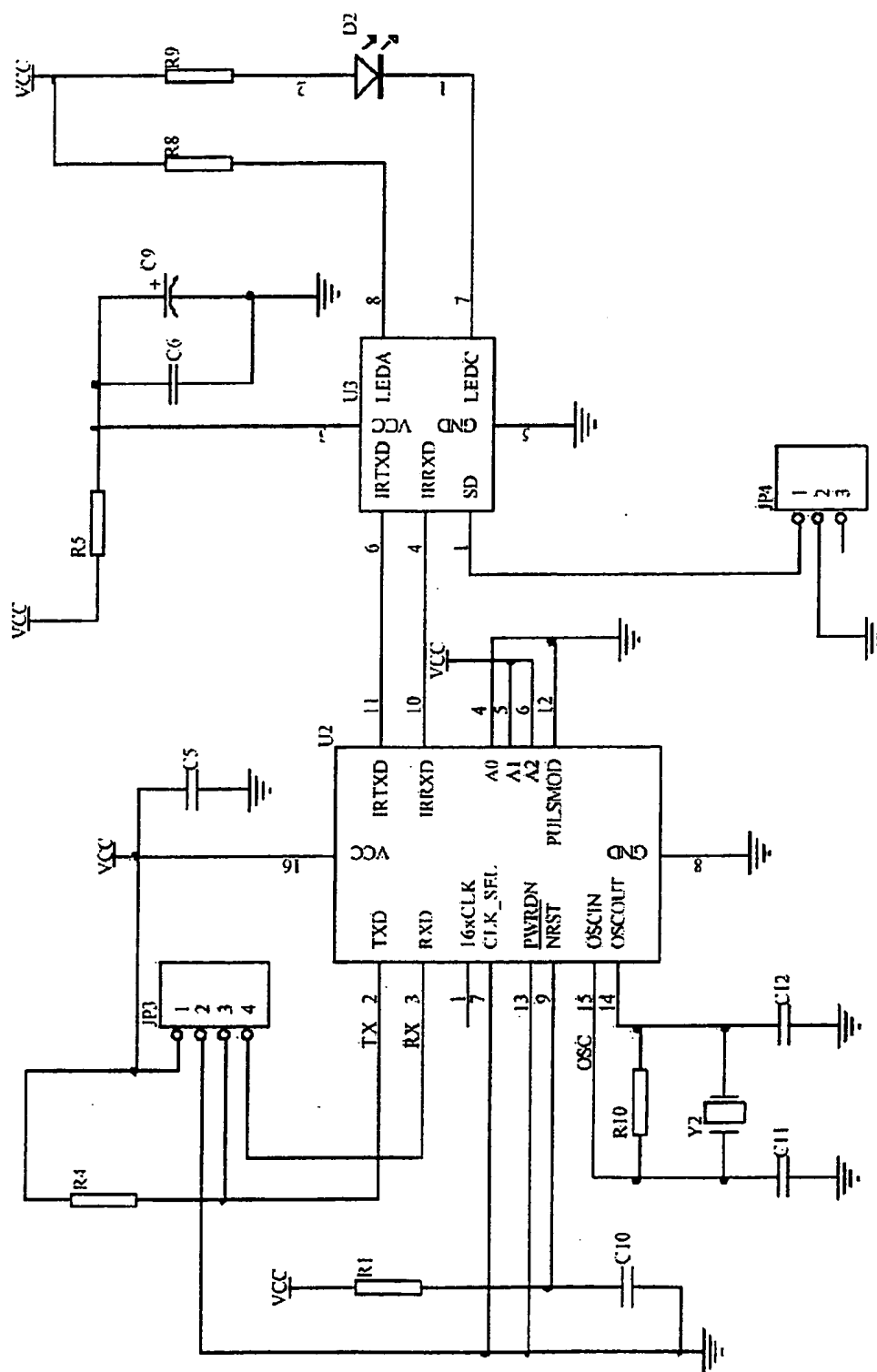
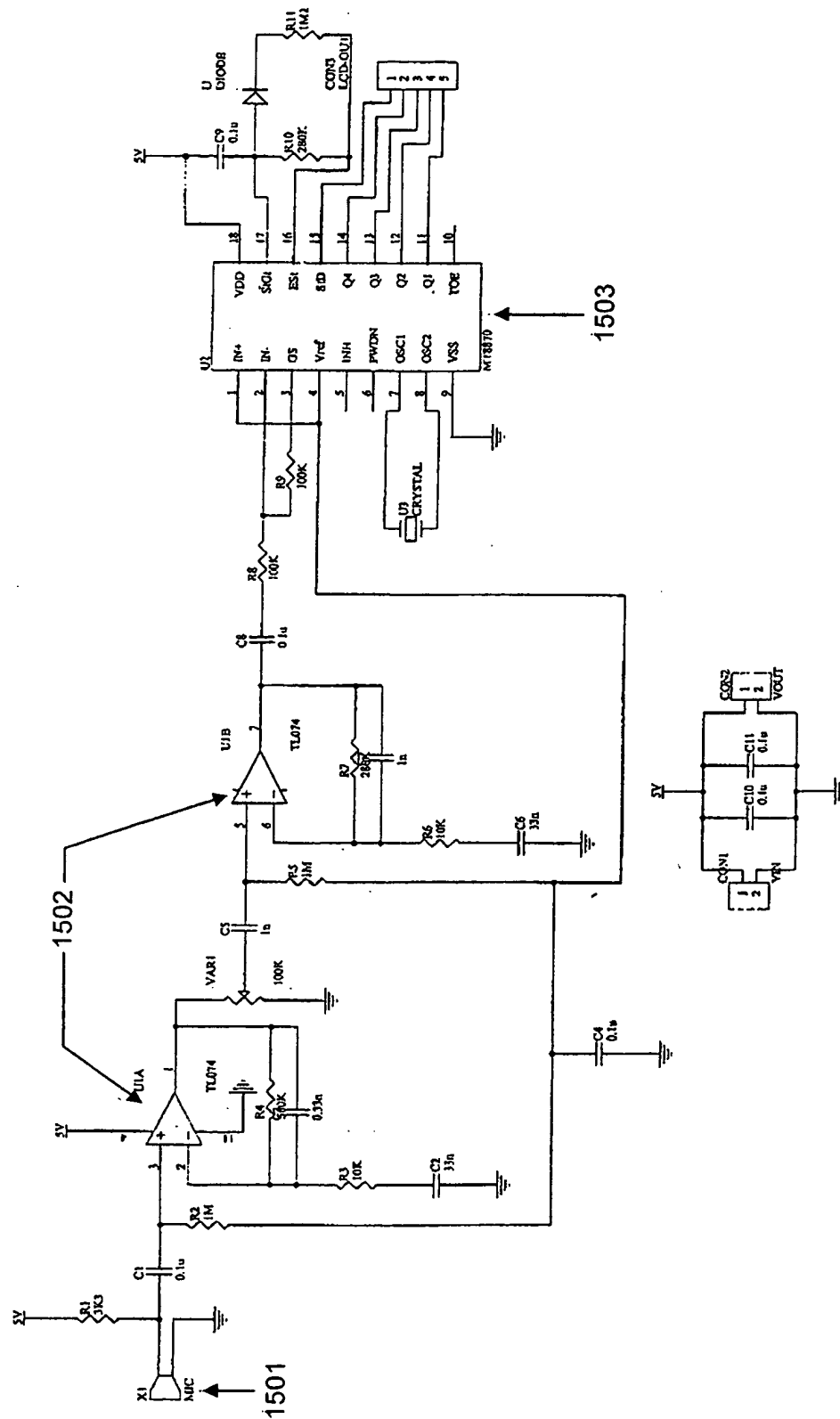


Figure 13



## Figure 14



## Figure 15

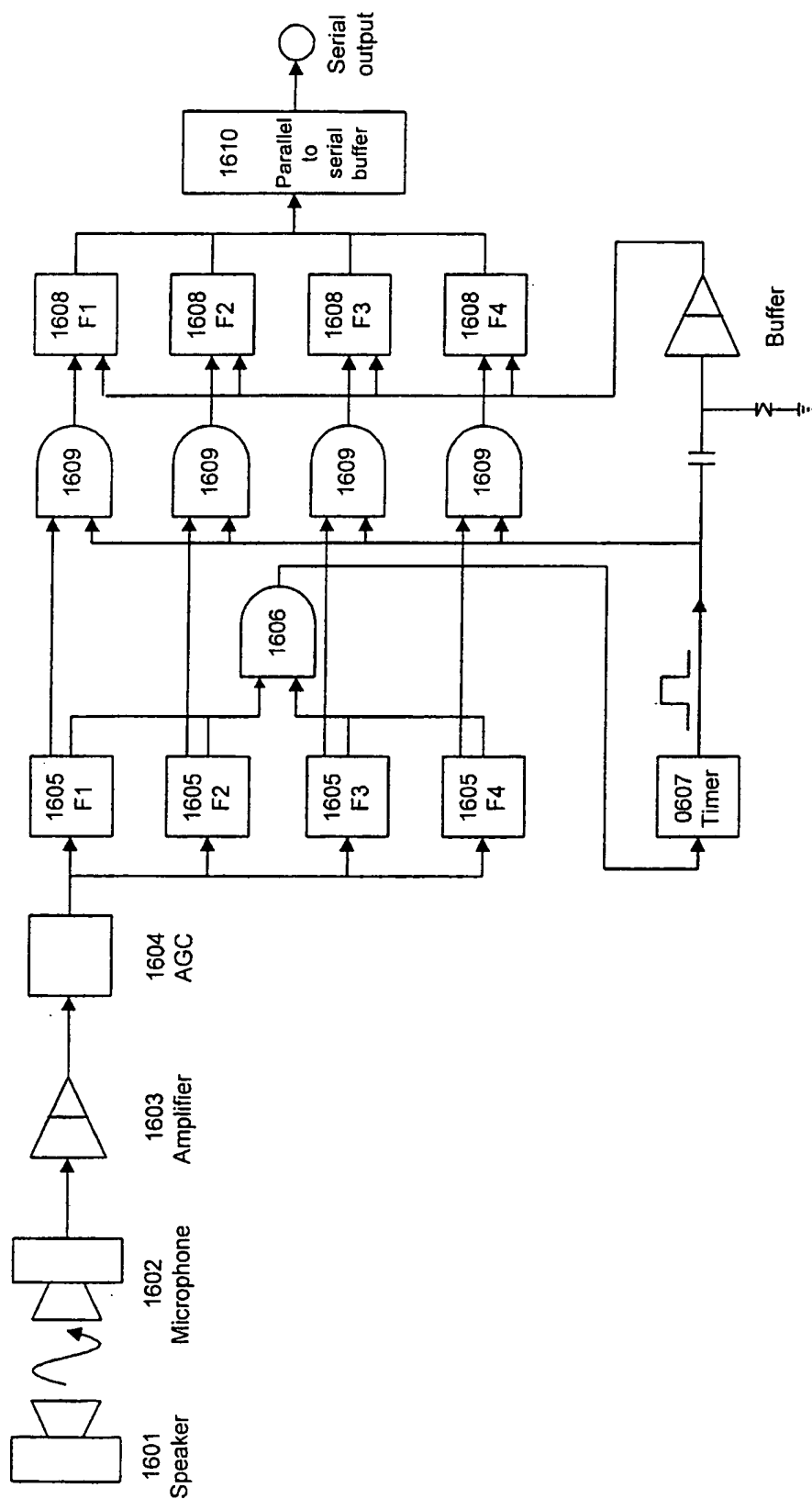


Figure 16

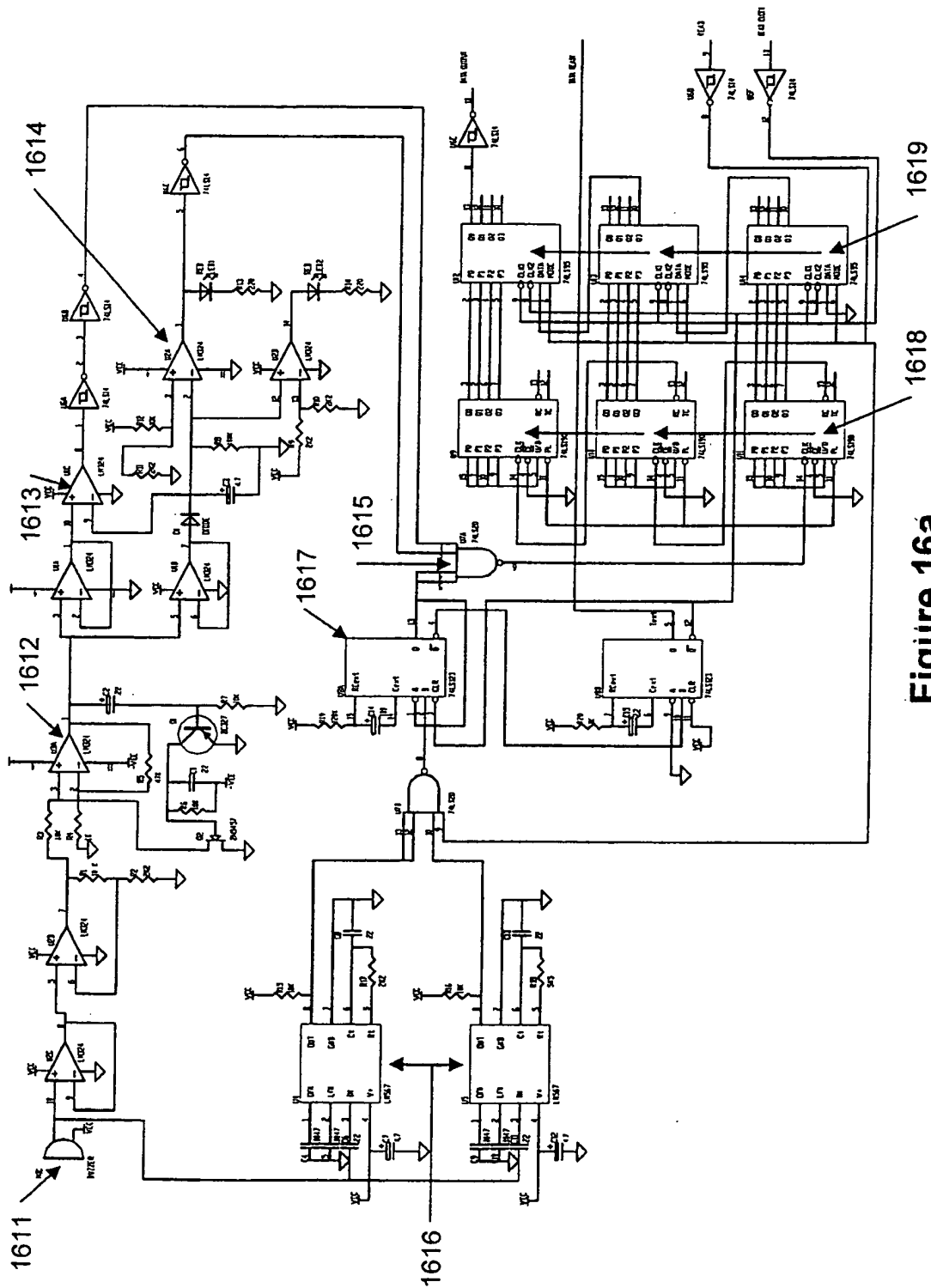


Figure 16a

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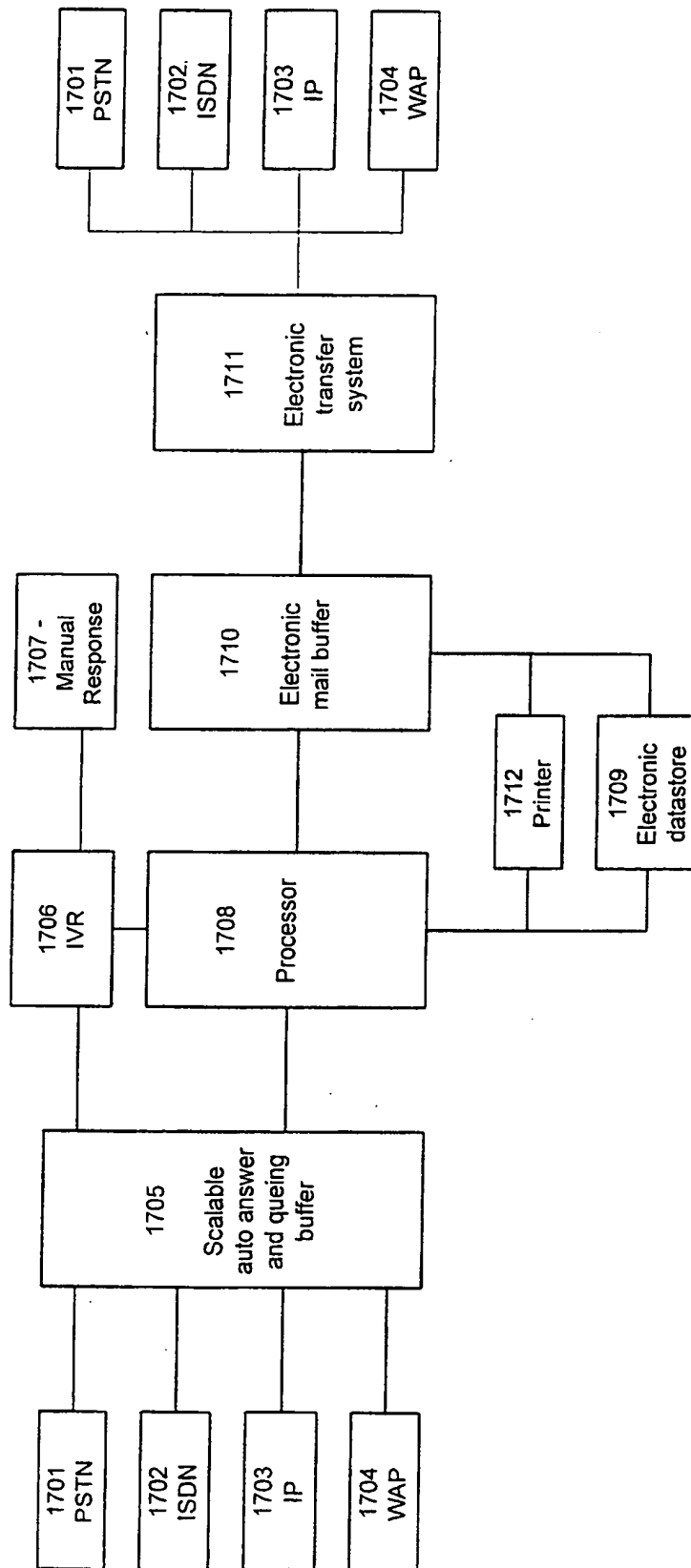
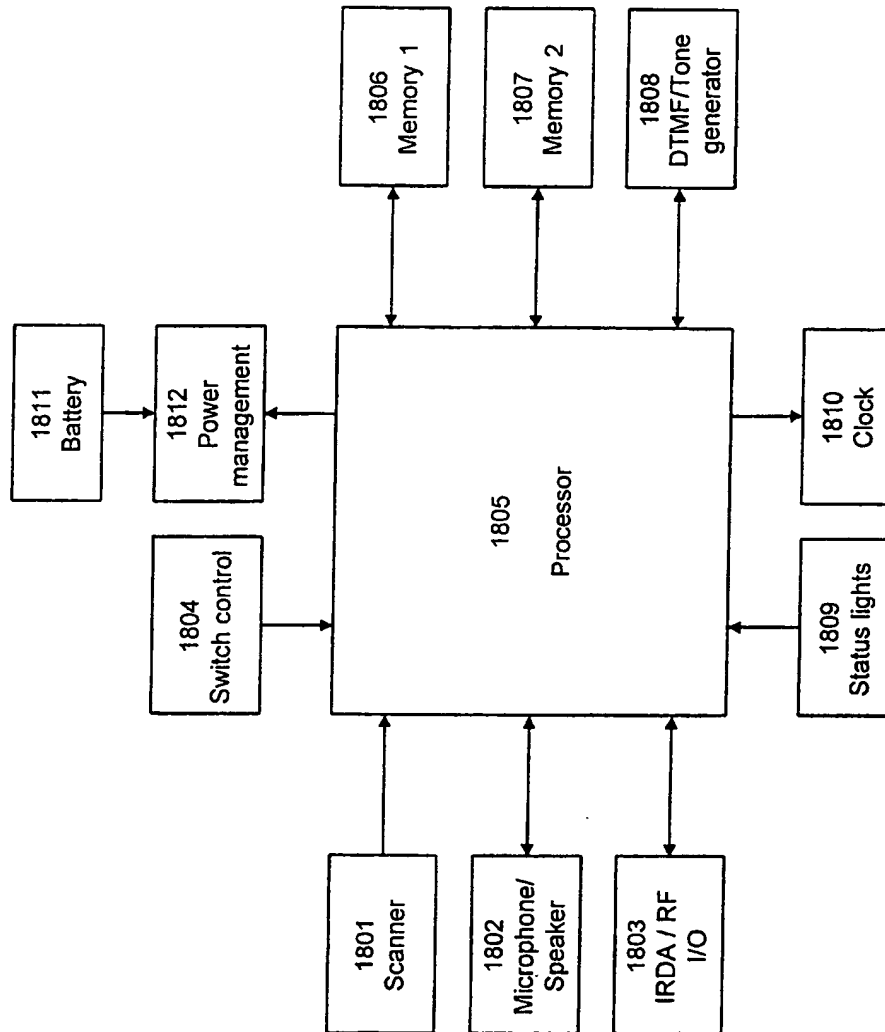


Figure 17



**Figure 18**